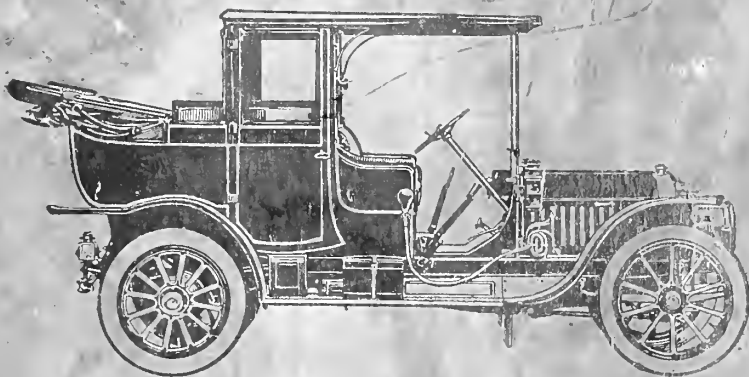


APRIL, 1910

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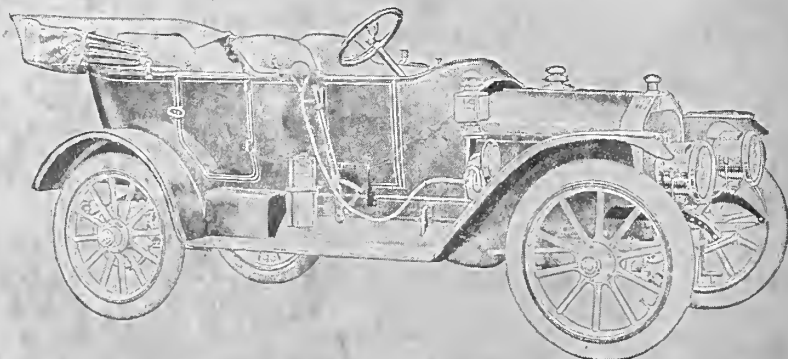
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# How to Find Things in This Directory

## ADVERTISERS' INDEX ON LAST THREE PAGES

**The information in this Directory and Hand Book is grouped in nine sections, as follows:—**

**SECTION I.** Classified Directory of manufacturers of complete cars, motor cycles, motor boats, flying machines and aeronautical material. (For index, see page 1.)

**SECTION II.** Classified Directory of manufacturers of parts, accessories, supplies, materials and miscellaneous articles (For index, see page 1.)

**SECTION III.** Classified directory of manufacturers of machinery, tools, factory, garage and shop equipment. (For index, see page 10.)

**SECTION IV.** Alphabetical list of Brands. (For index, see page 13.)

**SECTION V.** Trade Associations, National and Local. (For index, see page 13.)

**SECTION VI.** Useful information and recipes (For index, see page 14.)

**SECTION VII.** Tables and Data for Engineers. (For index, see page 14.)

**SECTION VIII.** Automobile Insurance, Accident, life and indemnity with sample policy. (Pages 588-590.)

**SECTION IX.** Digest of Automobile Laws of the various states. (Pages 591-597.)

In the Directory portion of the book the names and addresses of manufacturers and wholesalers are alphabetically listed under various headings—over 1200 in all—according to what they make or market. There are three distinct groups of these headings. The first group (pages 109 to 128) includes complete motor cars (electric, gasoline and steam), motorcycles, motor boats, flying machines and aeronautical material; the second group (pages 133 to 410) all parts, accessories, materials and supplies; the third group (pages 412 to 437) machinery, tools, factory, garage and shop equipment.

If you can't find what you want, write us. If this Directory is useful to you, don't forget to mention it when writing to advertisers and others.

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**Special feature of this Number.** Machinery and Tool insert, containing descriptions and illustrations of machinery, tools, factory, garage and shop equipment, pages 438-440.





# BEWARE OF ACIDS



6495  
6.05  
390  
604

# KEYSTONE LUBRICANTS

are your great protection from the acids lurking in inferior oils.

**Make Your Motor Make Good! Use KEYSTONE MOTOR OIL**

Manufactured from the BEST materials by the BEST process and insures  
under the most severe conditions

**MOTOR LUBRICATION—LESS CARBONIZATION**

KEYSTONE MOTOR OIL is wholly a PETROLEUM OIL, and positively contains no foreign substance,—either mechanical or chemical,—which in time might wear or corrode the parts to which it is applied. Have your dealer furnish you with a can, and insure yourself the MAXIMUM OF LUBRICATING EFFICIENCY.

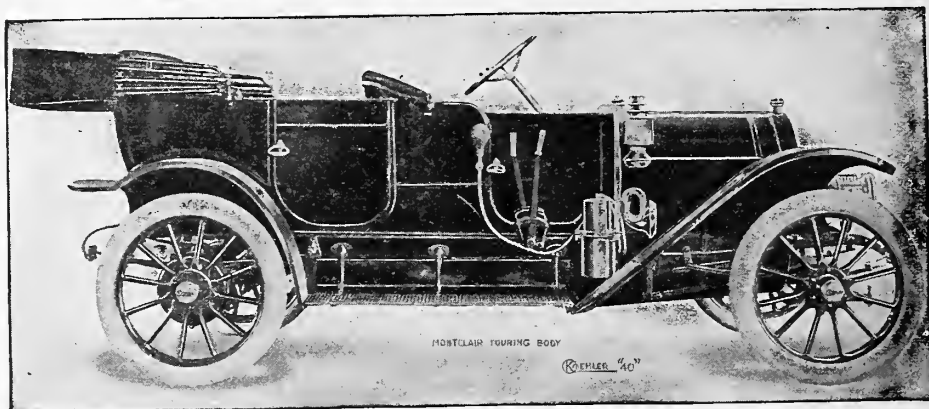
**KEYSTONE LUBRICATING COMPANY**

EXECUTIVE OFFICES AND WORKS:

20th Street and Allegheny Avenue, Philadelphia, Pa. Chicago address: Tacoma, Bldg.  
New York Office (Automobile Dep't.): 1777 Broadway. Boston address: Oliver Bldg.  
New Orleans address: 610-612 Chartres Street.

*We have no connection with the oil trust.*

# KOEHLER "40"



## AT \$1650.00

represents the greatest value thus far presented in the automobile business, and we think we are justified in stating that no automobile introduced this season has created such a sensation. The "Koehler 40" is a car developed as the result of twelve years' experience in selling automobiles, and in design, material and workmanship it is equal to cars selling for \$3000 and more. The type of body known as the "Montclair" is one of the most exclusive and luxurious styles introduced for 1910. High quality and low price are combined in the "Koehler 40" and it is therefore a car for the man who wants the best and full value.

### DEALERS:—

We can give you the most complete and best selling line in the United States for 1910. It includes the

EVERITT "30"	—4 cyl., 30 H. P., Touring Car,	\$1350
HUPMOBILE	—4 cyl., 20 H. P., Runabout,	\$ 750
RIDER-LEWIS	—4 cyl., 30 H. P., Touring Car,	\$1050
RIDER-LEWIS	—6 cyl., 7 passenger "	\$2500
KOEHLER "40"	—4 cyl., 5 passenger "	\$1650

We are general distributors for above cars in the following territory:

Koehler "40"	—United States.
EVERITT "30"	—New York City, Metropolitan District; Eastern N. Y. State, Conn., N. J., and N. E. Penna.
Rider-Lewis	—New York, New Jersey, Pennsylvania, Delaware and New England States.
Hupmobile	—New York, east of and including Rochester, North Eastern and Central Pennsylvania and New England States.

All models now on exhibition at our N. Y. salesroom.

Write us now for agency proposition.

# H. J. KOEHLER CO.

1711 BROADWAY, N. Y. CITY

# PANHARD OIL

This oil is manufactured from the best Pennsylvania crude stock—it has sufficient body to lubricate perfectly and will not carbonize—if used properly.

PANHARD OIL is made in one quality only—the best. But in four consistencies: Light, medium, heavy and extra heavy. It is important to use the right grade.

We sell PANHARD OIL at one price—because we make one quality.

There are concerns that sell 20-cent oil and 40-cent oil under the same name and brand; the quality varies as much as the price—it must. We believe this method is misleading—at any rate we do not do it.

If you want a cheaper oil we can supply it—but it is not PANHARD and does not go out under that name. It is a good oil—best, we believe, for the price.

You can save money, provided you have your own garage, by ordering by the barrel (containing 50 to 53 gallons) or half barrel (containing 30 gallons). We ask you to order through your dealer. Should you experience difficulty in getting the genuine PANHARD please advise us.

The systematic use of this oil will increase the speed and power of your car; a fair trial is the best proof.

PANHARD GREASES are as good as PANHARD OIL. We supply cup, transmission and graphite greases. Also heavy gear oil, etc.

Our booklet, "LUBRICATION," tells the whole story. It gives a lot of hints on oiling, besides many practical suggestions. The new edition is ready—write for a copy.



Address  
All Inquiries to

**GEORGE A. HAWS,** 72 Pine Street  
New York



## \$4,000,000 in Commissions to Dealers

5,000 Electrics were sold last year, according to the conservative estimate of a conservative journal—the Electrical World. We cannot speak for others, but this we know, that more than twice as many Waverley Electrics will be sold this year than last, at an average price that is well above \$2000.

The sale of 10,000 cars will divide four million dollars among the dealers. Do you want a share of this business?

The dealer who handles electrics has an all-the-year-round trade producing profits every month in the year. It is a gilt-edged trade that brings the highest class of customers to his stand. It is a satisfied trade that adds to his local reputation in his own town.

The uses for electrics are multiplying every day—the field is broadening, the opportunity for sales is increasing. The dealer who handles

## Waverley Electrics

represents a line that reaches every possible demand for electric vehicles in his territory.

The silent Waverley Coupe, Brougham, Victoria, Roadster and Stanhope may be seen on every boulevard of fashion and avenue of business; but not less well known and saleable are Waverley Electric trucks and delivery wagons for commercial uses.

If Electrics are not being pushed in your town, get in touch and have a share of that four millions; get Waverley Electrics if you can, but if not, some other kind.

Write for catalogs, prices and terms to dealers.

Exide, Waverley or National batteries used.

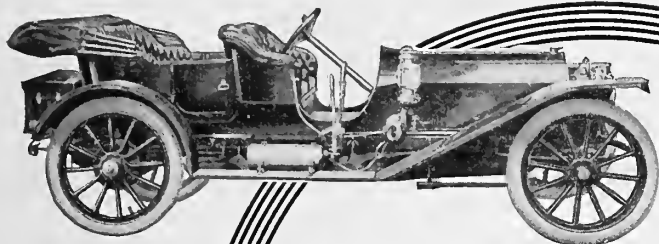
## The Waverley Company

Indianapolis

Indiana







**G 10  
Baby  
Tonneau**

## Kissel Kars Have All the High-Priced Features

Three-quarter elliptic springs, integrally fastened to rear end of frames, dropped frame, liberal wheel base for weight and capacity of cars, increasing the easy riding qualities and decreasing side jolts, tire and general wear throughout the machine.

With the exception of the \$1500 car, all models have selective type transmission, four speeds forward and reverse with direct drive on third speed and speed gear of 25% over motor on fourth speed, ball bearings throughout on all cars, double internal brakes, 14" drums, all forgings of heat-treated Chrome Vanadium Steel.

# KISSEL KAR

## Eighteen Models

### \$1500 to \$4200

**Model L. D. 10**  
4 cyl., 30 H. P.  
Touring Car, \$1500  
Baby Tonneau, \$1500  
Coupe, \$2100  
112" wheel base  
4 and 5 passengers

**Model F. 10**  
Touring Car, \$2500  
Baby Tonneau, \$2500  
Coupe, \$3100

Limousine, \$3700  
4 cyl., 50 H. P.  
124" wheel base  
7 passengers

**Model D. 10**  
4 cyl., 50 H. P.  
Touring Car, \$2000  
Baby Tonneau, \$2000  
Coupe, \$2600  
Limousine, \$3200

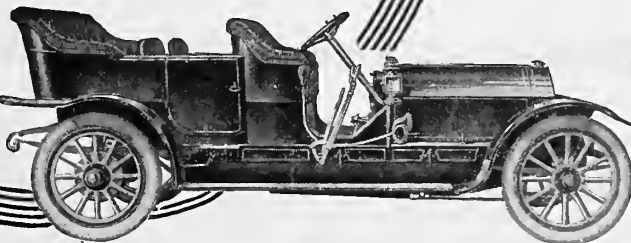
120" wheel base  
5 and 7 passengers

**Model G. 10**  
Touring Car, \$3000  
Baby Tonneau, \$3000  
Coupe, \$3600  
Limousine, \$4200  
6 cyl., 60 H. P.  
132" wheel base  
5 and 7 passengers

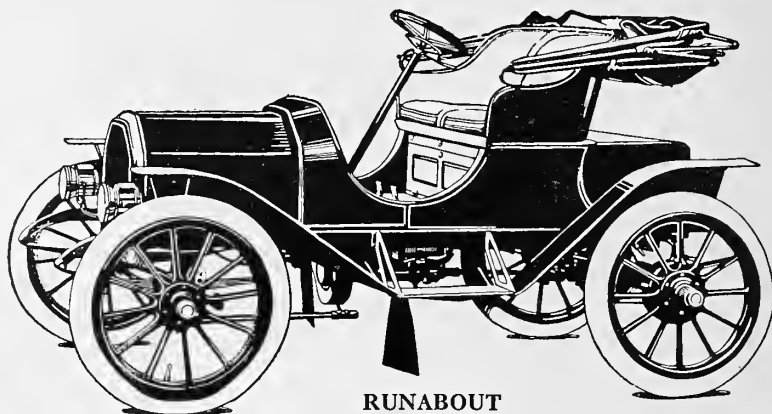
WRITE FOR CATALOG

**KISSEL MOTOR CAR CO.**

120 Kissel Ave.  
HARTFORD  
WIS.



**G 10 Touring Car**



RUNABOUT

## What Makes a Good Electric?

Most advertisements of electric motor cars read as if the makers were selling PARTS instead of complete cars. One maker advertises his motor, another his controller, another his handsome body designs, another the batteries he uses, and so on. Each advertises **the thing he thinks makes a good motor car**. Most of this "special feature" advertising has been brought about by the popularity of the Baker Bevel Gear Shaft Drive. Other makers have sought to put forward "counter claims," and have overlooked the essential fact that the success of the

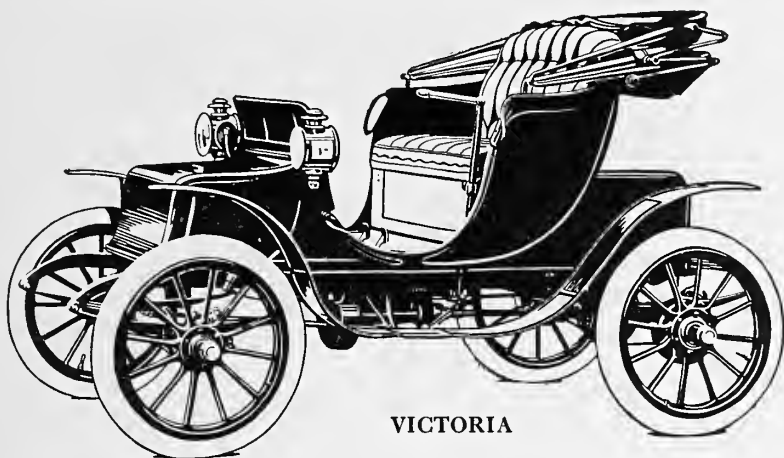
## Bevel Gear Shaft Drive Baker Electrics

is not due to the **type** of the transmission. It is due to the **experience** and **ability** that have enabled the Baker designers to produce a **balanced** car in which every feature is as good as every other feature, and **better** than the same feature in any other car.

**THE BAKER MOTOR** is larger than in any other electric, and is more efficient in proportion to its size. It will develop more actual power with a given "draw" on the batteries than any other vehicle motor ever built. Has a large commutator; will take the heaviest overloads without sparking or burning. Will run a season without attention.

**THE BAKER CONTROLLER** is the patented continuous torque drum type. Its superiority is shown by the fact that it has been adopted by all electric railroads in Europe and America, superseding the knife switch type of controller which is still used on most electric motor cars.

**THE BAKER TRANSMISSION** is Baker Bevel Gear Shaft Drive. The only **genuine** shaft drive. The drive that has been giving satisfactory service on our larger models for nine years, and that all other makers of electrics are experimenting with **now**. The drive that makes the Baker the **ONE** electric that you can buy **this** year with the assurance that it will not be obsolete **next** year.



VICTORIA

**THE BAKER SPRING SUSPENSION** is an exclusive Baker feature consisting of a patented shackle in place of the rattling radius and torsion rods found in ordinary electrics. The most flexible suspension ever devised.

### **THE BAKER CUSHIONED STEERING CONNECTIONS**

are an instance of that "perfection in little things" that gives to Baker owners "all the pleasures of motoring with all the annoyances eliminated."

**THE BAKER CENTER BEARING WHEELS** look like others, but are built differently and ride differently. They are part of the reason why Baker Electrics go "farthest and fastest on a single charge."

**THE BAKER BODIES** must be seen to be appreciated; they will stand comparison with the best efforts of the foremost carriage builders; and they have that one refinement of luxury that is wanting in all other electrics—a perfect machine under them.

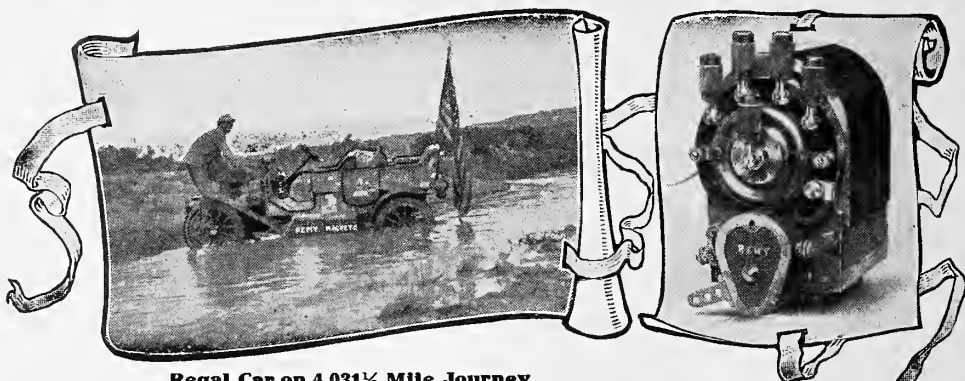
These details are not the reason for the steadily increasing popularity of the Baker Electric. They are simply the **explanation** of the reason. The reason itself is **BAKER PERFORMANCE**—superior speed, mileage, dependability, durability and easy riding qualities. The Baker Electric is the easiest car to sell because in the exacting test of year-in-and-year-out service, it has proven itself the most satisfactory car to **own**.

The demand for Shaft Drive Electrics, and the fact that no other maker will have Shaft Drive models ready before next year, makes the Baker Electric the one big opportunity for live agents in 1910. Write for Catalog and information regarding open territory.

## **The Baker Motor Vehicle Company**

35 West 80th St., Cleveland, Ohio, U. S. A.

The Oldest and Largest Manufacturers of Electric Motor Cars in the World



**Regal Car on 4,031½ Mile Journey**

## Remy Magneto Under Water for Hours

Required no adjustment. Batteries not needed. Success of this record trip from Coast to Coast largely attributed to perfect results of Remy Magneto.

REMY ELECTRIC COMPANY, Anderson, Indiana.

Gentlemen:—Referring to the trip, made with the Regal "Plugger" from New York to San Francisco in which we lowered the touring car record from Coast to Coast. I wish to say that your magneto proved satisfactory in every way; no adjustments of any description were made and no attention paid to it whatever, and yet it never failed to give results.

We used no batteries on the entire trip, starting entirely on the magneto, and although at times the entire engine was submerged in water for hours, we noticed no effect whatever on the magneto, or the result given from the same. We attribute a great deal of our success on this trip to the fact that we had no trouble whatever with your magneto.

Wishing you every success, and trusting that should I again make such a journey I may have a car as good as the Regal "Plugger" and that it will be equipped with a Remy Magneto, I am,

Very respectfully yours, (Signed) WILLIAM H. SMITH.



**Cobe Trophy Won by the Aid of the Remy Magneto**

# Over 100,000 Remy Magnetos Sold for 1910

Not a quantity user who helped make our immense 1909 season but that has adopted the Remy for 1910, besides many manufacturers have adopted the Remy for 1910 who formerly used other magnetos. Our factory is the largest and best equipped plant in the world devoted exclusively to magneto manufacturing. Dept. 13.

[20]

## REMY ELECTRIC CO., Anderson, Indiana

### BRANCH DISTRIBUTING OFFICES:

CHICAGO, 1400-1402 Michigan Avenue; NEW YORK CITY, Automobile Bldg., 64th and Broadway; DETROIT, 471 Woodward Avenue; KANSAS CITY, 406 East 15th Street; SAN FRANCISCO, 170 Golden Gate Avenue.

### AGENCIES:

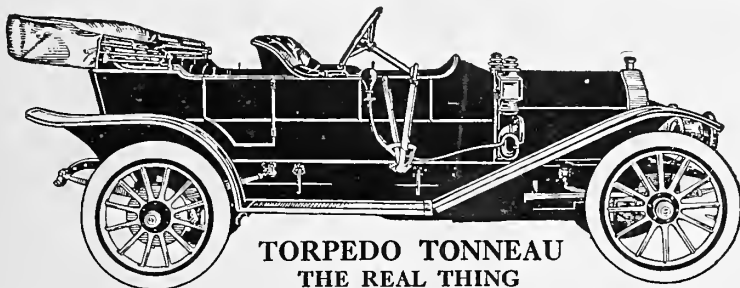
Auto Equipment Co., 1518 Broadway, Denver, Col.; Hollis Electric Co., 9 N. Sixth St., Minneapolis, Minn.; J. H. McCullough & Sons, 219 N. Broad St., Philadelphia, Pa.

# THE **SELDEN** CAR

MADE BY THE FATHER OF THEM ALL

The Selden line of cars for 1910 embraces the following models:

Model 35-T, five-passenger touring . . . . .	\$2,000
Model 35-R, three-passenger roadster . . . . .	2,000
Model 35-P, four-passenger torpedo tonneau . . . . .	2,250
(with Bosch magneto)	
Model 35-S, seven-passenger touring . . . . .	2,500
(with Bosch magneto)	
Model 35-L, six-passenger limousine . . . . .	3,000



**TORPEDO TONNEAU**  
**THE REAL THING**

Our 4-cylinder motor is  $4\frac{1}{2} \times 5$ , A. L. A. M. Rating, 36.1 H. P.; wheel base is 122 inches on the seven-passenger, 116 inches on the others; clearance, 10 inches on all; Bosch magneto, Stromberg carburetor; wheels, 36-inch on the seven-passenger 34-inch on the others. The high quality and faultless construction of every Selden car is guaranteed.

- 
- “I wish to compliment you on the Selden car,” writes a wealthy gentleman who is considered an expert judge, and has in his garage several other cars, each of which cost from one to three thousand dollars more than his Selden.
- “On carefully looking it over my former good opinion of it has gone up fifty per cent.” Many a poorly built car, ornate with tinsel, brass and color varnish, has fooled people who looked at it ten feet away, but it takes a car like the Selden to stand close critical inspection.
- “It is the best car at anything approaching its price of which I have any knowledge.” This is literally true, too.
- “In general ease of manipulation and pleasure of running, few cars can compete with it. I am particularly pleased with your system of gear shift.” And so our friend runs amiably on and fulfils his self-imposed duty (evidently a pleasure to him) of letting us know how well he likes his car. We are very glad to have his good opinion, and to know he is commending the Selden car to his friends. This is only one of many incidents taking place all over the country, every day, every time a new Selden car stirs a community. It takes quality in goods to maintain a reputation of this kind.
- 

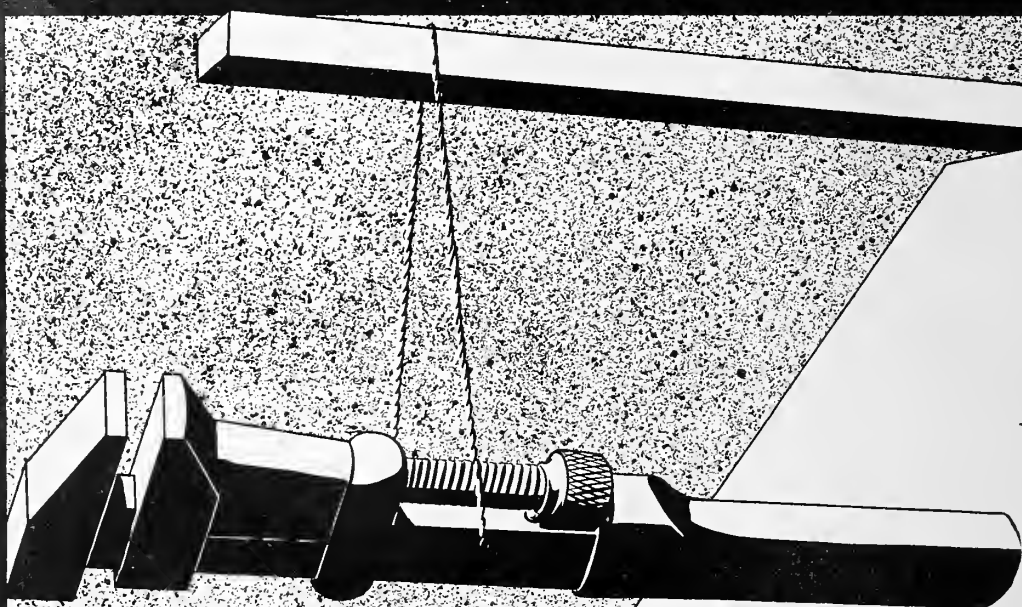
ASK FOR CATALOG

## Selden Motor Vehicle Co.

GEO. B. SELDEN, President

ROCHESTER, NEW YORK

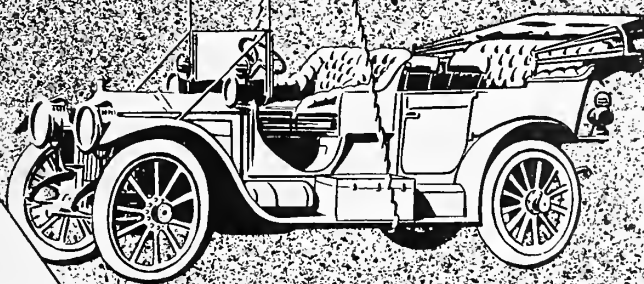
Licensed under Selden Patent



# WELL BALANCED COES

¶ The **Coes Wrench** is offered to the motorist who has bought and paid for experience, and who wants to make up for lost time by making sure of the wisdom of future investments when making purchases of anything for his car. The **Coes Wrench** is designed expressly to set a new standard in accuracy, finish, and detail refinement, and to make good with the man who knows.





# IF EQUIPPED WITH WRENCH

¶ If you would enjoy that "PERFECTLY BALANCED" feeling,—thoroughly confident that you are prepared to face even the most trying ordeal with impunity,—head your "TOOLS NEEDED" List with the "Coes Wrench,"—the wrench that bears the star trade mark. This means that seventy years of experience have contributed to make the Coes the highly satisfactory tool it is today.

*Our wrench book will  
be sent free on request*

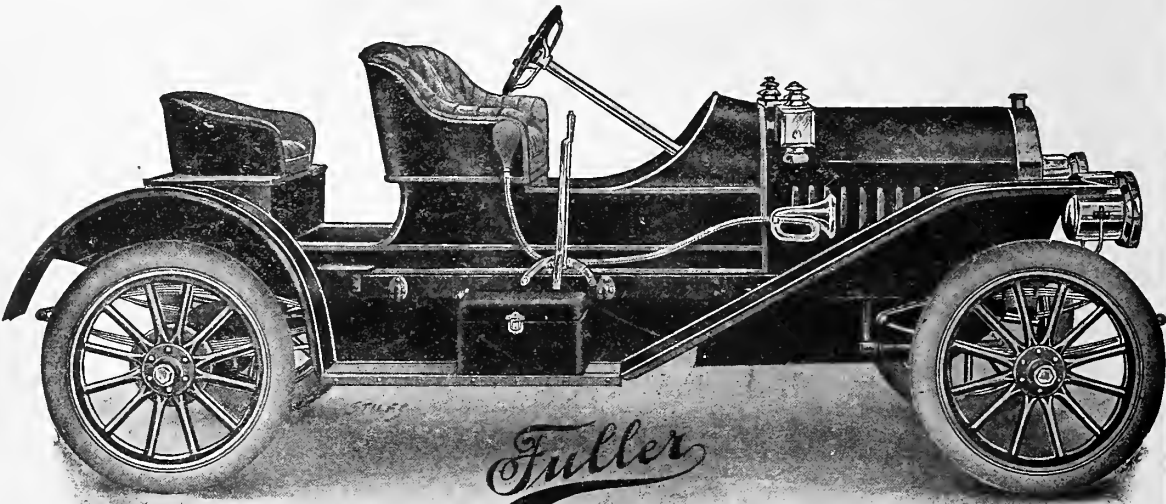
**COES WRENCH CO., Worcester, Mass.**

NEW YORK { J. C. McCarty & Co., 21 Murray Street, New York City  
AGENTS { J. H. Graham & Co., 113 Chambers Street, New York City

# THE FULLER

## A Representative Type of America's Best Production

Pneumatic and solid tire cars at prices ranging from \$775.00 to \$1165.00  
Two and four-cylinder cars, both pleasure and commercial.



### Model "30" Roadster

Body—Roadster design, with single rumble seat.

Motor—Four-cylinder, vertical, cast en bloc, 3½-inch bore, 4½-inch stroke, 25-30 horsepower. Cylinders, piston, piston rings, piston pins, crank shaft, cam shaft and valve stems are ground. The motor is water cooled, circulation by the thermo-syphon system. Lubrication by circulating oil system, operated by plunger pump driven by cam. Crank case is divided so as to maintain the same level of oil for each cylinder.

Transmission—Silent planetary type, two speeds forward and reverse, multiple disc clutch.

Motor Control—Spark and throttle levers on steering wheel.

Drive—Shaft drive with bevel gear.

Ignition—Jump spark, dry cells.

Carburetor—Float feed type.

Brakes—External hub brakes on rear wheels opened by foot pedal. Expanding internal hub brakes operated by hand lever.

Weight—1800 lbs.

Wheel Base—100 inches.

Tread—56 inches.

Frame—Pressed steel.

Front Axle—"I" beam.

Springs—Full elliptic front and rear.

Gasoline Capacity—Twelve gallons.

Tires—30x3½ inches.

Equipment—Side oil lamps, tail lamp, horn, jack, tools, tire repair kit, pump and top irons.

**Price, \$1065.00. With Touring Body, \$1165.00**

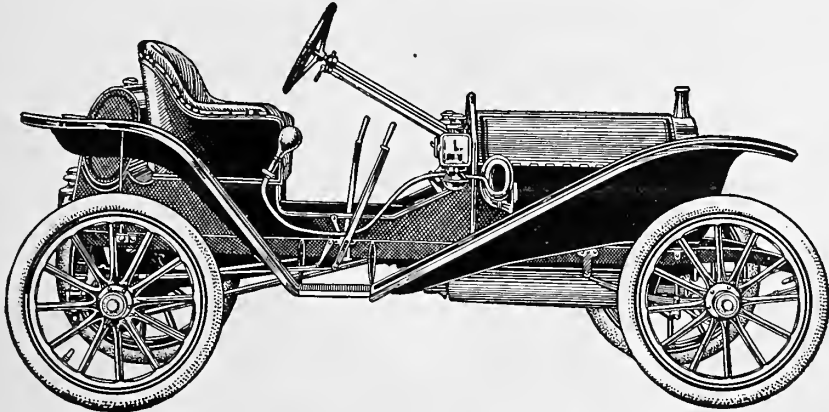
Style, simplicity, efficiency, reliability and quietness are the conspicuous features. If you are in search of these qualities, any comparison you may make **MUST** confirm the fact that the "Fuller" is the greatest value the automobile world affords.

Investigate—find out for yourself. Send for catalog.

**FULLER BUGGY COMPANY,** (Dept. A) Jackson, Mich.

Licensed under Selden Patent

# Never Daunted Never Discouraged



4 Cylinders  
20 H. P.  
Sliding Gears  
Bosch Magneto

*Hupmobile*

**\$750**  
(F. O. B. Detroit)

When the Hupmobile made its first appearance a year ago the industry and the motor buying public gasped in amazement.

But haste was made to bestow upon this \$750 car rank with the finest and costliest of the larger cars.

And this rank belonged rightfully to the Hupmobile, because in motor design, in the steels and other materials employed, in fineness of measurement and manufacturing standards, it matched these larger cars part for part.

All through the year that has intervened the Hupmobile, in the hands of several thousand owners, has been emphasizing and justifying this equality in power, silence, quality of service—in all save carrying capacity.

The latest Hupmobile achievement was one that will go down in the country's motoring annals as noteworthy.

This was the trip of three cars from Detroit

to New York, through the winter's deepest snow and bitterest cold.

From December 27th to January 6th these three cars broke trail through a thousand miles of snow that rendered even huge railroad locomotives powerless.

Never for a moment did they falter; and all reached New York in "the pink of condition"—ready to be turned back for the thousand-mile stretch to Detroit.

The trip was an object lesson—planned and successfully completed merely to demonstrate anew the Hupmobile's fitness for going under conditions in which many larger cars would be utterly helpless.

It has proved again—if more proof were needed—that the Hupmobile is as staunch and true and fine as the staunchest and finest large car built.

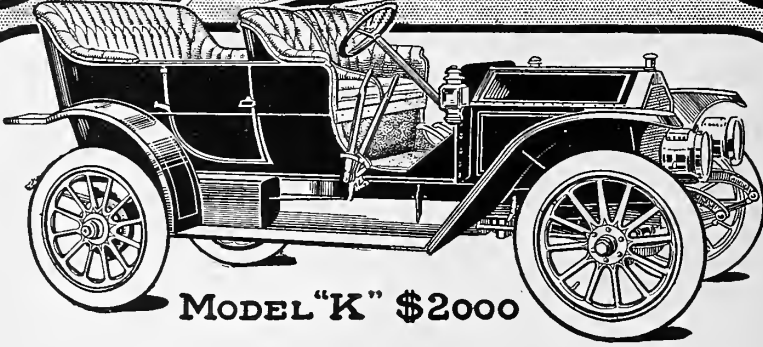
You should not ignore the opportunity to see and test the Hupmobile, and to send for the literature.

**Hupp Motor Car Co., Dept. A, Detroit, Michigan**

Licensed under Selden Patent



# Pullman



MODEL "K" \$2000

## "The Car that Continuously Lives up to Its Name"

PULLMAN Automobiles are free from motor troubles, because their motors have been built fundamentally right for six years. They are long stroke motors and develop considerable power at slow speeds.

The motors in the 1910 models are larger in accordance with the liberal policy of the PULLMAN Company to provide the maximum power consistent with perfect mechanical balance and reasonable weight of car. We can beat any stock car of equal rating, power for power.

The transmissions of PULLMAN Automobiles, and other vital parts, are constructed of Chrome-Vanadium steel—the great "Anti-Fatigue Steel," which insures long life and freedom from breakdowns.

### "Not Only the Best at the Price, But the Best at Any Price"

#### MODELS and PRICES:

Model "K-10"—35 H. P. Touring Car or Roadster	\$2,000
Model "4-40"—40 H. P. Roadster	3,000
Model "M"—50 H. P. 5 or 7-passenger Touring Car	3,500
Model "O-10"—30 H. P. Toy Tonneau or Roadster	1,650

Write for Descriptive Catalog of 1910 Models

## Pullman Motor Car Co., Inc.

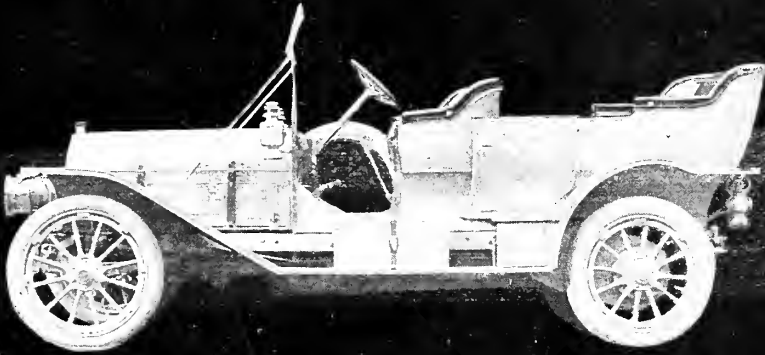
Department P, York, Pa.

Licensed under Selden Patent

LOOK UP OUR NEAREST AGENT AND GET A DEMONSTRATION

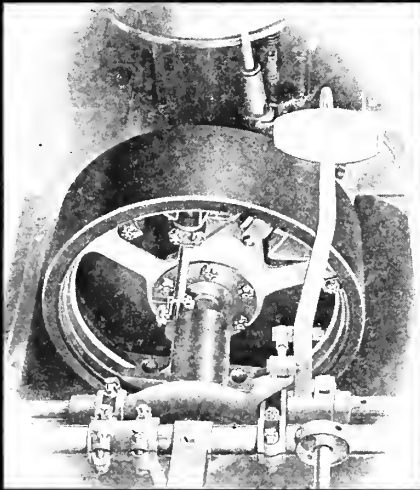
# Great *Chadwick* Six

is justly termed the Car of Exclusiveness, for there are more exclusive and meritorious mechanical features incorporated in the CHADWICK than in any automobile built in either America or Europe.



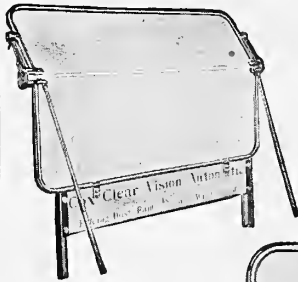
THE 1910 CHADWICK TOURING CAR. PRICE, \$5500

***Runabouts      Tourabouts      Landaulets***  
***Limousines***

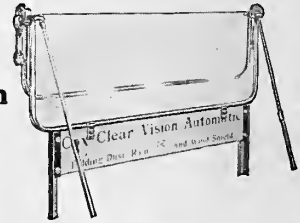


Another exclusive and meritorious feature of the CHADWICK is the internal expanding Clutch, which is entirely different from other Clutches of this type. The wearing parts may be removed in two or three minutes without disturbing the adjustment. In action it is soft and silent and free from all jerking. A slight foot pressure controls the clutch absolutely. Send for Catalog, explaining this and numerous other exclusive features of the CHADWICK.

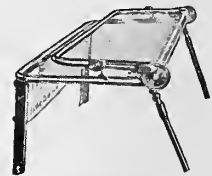
**Chadwick Engineering Works**  
**Pottstown, Pa.**



Rain Vision



Half Folded Position



Full Folded Position



Inclined Position

## PRICES

42 in. wide, \$45. 44 in. wide, \$50

## The Cox Clear Vision Duplex

Affords the many positions illustrated above. This shield contains **More Exclusive Features** than any other wind shield made. Why be satisfied with a shield of ancient design any more so than a car made five years ago? With any of the **Cox Clear Vision Shields** you feel satisfied that you are up to the minute.

Have you seen the **Clear Vision Junior**? The Shield for the small car. Write for catalogue of **Clear Vision Shields**. A shield of quality for small and large cars. Prices from \$27.50 to \$55.00. Liberal discounts to dealers. Write for more particulars. A shield for every car.

**BRASS**  
**UTOMOBILE**  
**A**CCESORIES

**COX BRASS MFG. CO.**  
ALBANY, N. Y.  
Established 1872  
New York Office: 1777 Broadway.

### Some of Our Specialties

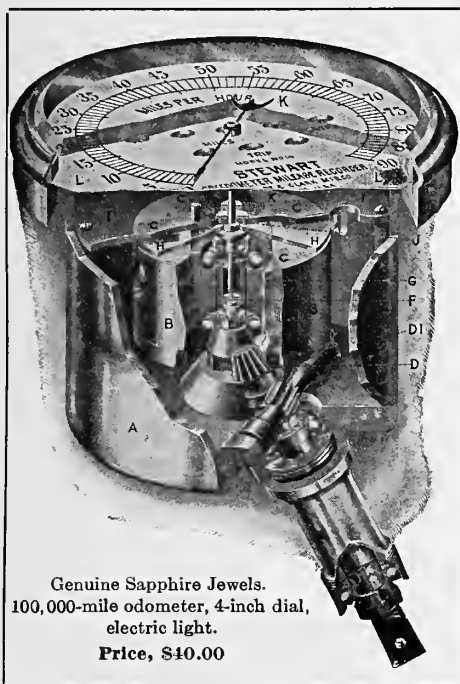
Wind Shields  
Bumpers  
Tire Pumps  
Tire Holders  
Robe Rails  
Foot Rests

Lamp Brackets  
Oil Pumps  
Clocks  
Check Valves  
Grease Guns  
Foot Pedals

Reflectorscopes



# We Are Exceedingly Proud of this New Stewart Special



All agree it is the handsomest yet produced; more compact, one-third lighter, with beautiful lines, it is indeed an ornament. Inside, the mechanism is simplified, while the workmanship and finish speak volumes as to the equipment and preparation necessary to produce it.

## Dealers Everywhere Are Enthusiastic

### Stewart & Clark Manufacturing Co.

500 Diversey Boulevard, Chicago, U. S. A.

# Every Tire is Oversize

Each Goodyear Detachable Auto Tire is considerably larger than its rating. So in Goodyear Tires you get extra size plus extra quality. Larger tires mean increased mileage, less punctures and blow-outs and more satisfaction.

## The Landslide to Goodyears

Because of this oversize feature and the other Trouble-Saving and Extra-Service-Giving features, to be found only in Goodyear Tires, we have been awarded contracts from 44 Automobile Manufacturers to equip 36% of the estimated 150,000 cars to be made in 1910. The contracts total up to the greatest number of tires ever ordered from a single tire maker in the history of the automobile industry.

See what this oversize value amounts to in a 4-inch tire. Big extra mileage.



## Other Points of Merit

Goodyear Auto Tires are **guaranteed** against Rim-Cutting, Creeping and Coming Off. The outer sides of the tire are straight, permitting the use of a rim with a wide rounding lip where it holds the tire in place. There are no sharp edges—nothing to cause a rim-cut even though the tire be ridden flat.

64 tapes of piano wire are vulcanized into the base of each tire (see white spots in section). These contract with inflation until the tire grips the rim so tightly that it can never creep, even though but partially inflated. No tire bolts need be used. Goodyear Tires are supreme in resiliency, and are easiest removed and replaced.

# GOOD YEAR TIRES

These are but a few of the exclusive patented features of Goodyear Tires. They save trouble and expense and insure such unheard-of mileage that users who have once ridden Goodyear Tires can never be induced to use any other kind.

At the Grand Central Palace Show Goodyear Tires led in number of American-made pleasure cars equipped by over 40%. Send for our valuable book, "How to Select an Auto Tire." It's brimful of "Tire Sense" and is free for the asking.

**GOODYEAR TIRE & RUBBER CO.,** Main Office and Factory: **Warwick St., Akron, Ohio**

**BRANCHES:** Boston, 669 Boylston St.; Buffalo, 719 Main St.; Chicago, 80-82 Michigan Ave.; Cincinnati, 317 East Fifth St.; Cleveland, 2005 Euclid Ave.; Detroit, 251 Jefferson Ave.; Los Angeles, 949-951 South Main St.; New York City, 64th St. and Broadway; Philadelphia, Broad St. and Fairmount Ave.; Pittsburgh, 5983 Centre Ave.; San Francisco, 535-539 Golden Gate Ave.; Washington, 1028 Connecticut Ave.; Omaha, 2020-2022 Farnam St.; Milwaukee, 188-192 Eighth St.; Memphis, 181 Madison St.; Dallas, 111 North Akard St.; Kansas City, 16th and McGee Sts.; New Orleans, 706-716 Baronne St.; Atlanta, 90 North Pryor St.; Providence, 366 Fountain St.; Minneapolis, 915 First Ave., South; St. Louis, 3935-3937 Olive St. (33)

# The MAXIMUS Makes Motors Mote

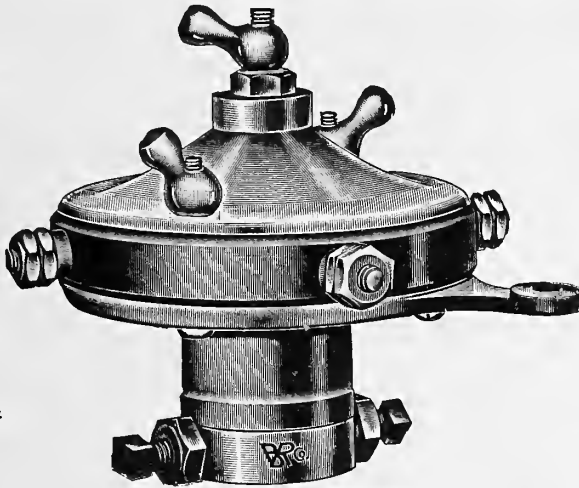
Over 12,000 satisfied users. If you are not one of them, you should be; they save your temper, time and money.

PATENTED JUNE 2, 1908

More  
Speed



More  
Power



THE "MAXIMUS" TIMER

Less Plug  
Trouble



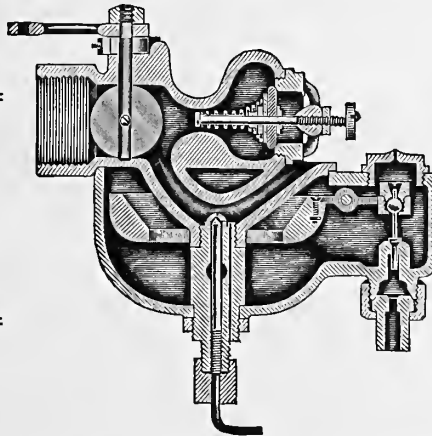
Less Coil  
Trouble

We know we have the best timer made, and that it will improve the speed, power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent. of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

## The MAXIMUS CARBURETOR

Simplified  
Carburetion



List Price

1-inch Size, \$11.00  
1½-inch Size, \$12.00

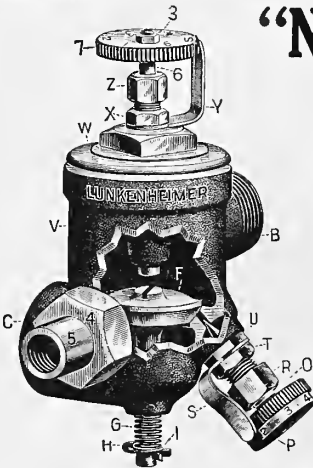
The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

MADE BY

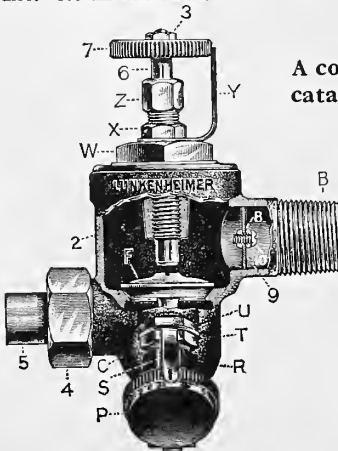
The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.

**TYPE A**

With sliding throttle controlling the outlet passage. No regulation for lift of disc.

**TYPE B**

With regulation for lift of disc. No throttle valve.

**TYPE C**

With means for regulating lift of disc and butterfly valve in outlet passage.

# Successful Where Others Have Failed

Gasoline engines that could not be made to work satisfactorily have given results when equipped with

## Lunkenheim "Nonpareil" Generator Valves

The material is of the very highest grade, and the discs are made of an extremely strong bronze composition, the tensile strength being about 50,000 pounds per square inch.

Lunkenheim "Nonpareil" Generator valves are absolutely reliable, exceptionally durable and will positively give satisfactory results if properly connected and regulated.

They are made in a variety of styles and in sizes from  $\frac{1}{2}$  to 2 inches inclusive.

Your local dealer can supply them; if not, write us.

A copy of our automobile and motor boat specialty catalogue will be sent upon request. It's free.

## The Lunkenheim Company

Largest Manufacturers of High - Grade Engineering Specialties in the world.

General Offices and Works:

Cincinnati, Ohio, U. S. A.

Branches:

New York, 66-68 Fulton St.  
Chicago, 32 Dearborn St., Cor. Lake  
London, S. E., 35 Great Dover St.

# *The* **IDEAL AUTO LIGHTER**

1. The IDEAL lights your gas lamps without stopping or alighting from your car.

2. It will save 25 per cent. of your gas and will pay for itself in less than one season's use.

3. It can be installed on the dash or under the hood of any car by the owner or driver and at a nominal expense.

4. It is as handsome and ornamental as a speedometer or clock.

5. Your present ignition system will operate it, as it works equally well on magneto, storage battery or dry cells.

6. It is utterly impossible for you to have an explosion of gas in your headlights, as the turning on of gas and the lighting of both lamps is done simultaneously and with ONE movement of the controller handle.

7. Lights extinguished by closing valve.

8. Flow of gas and lighting of head-lights

is controlled entirely by THE IDEAL, just as long as there is gas in tank and juice in ignition system.

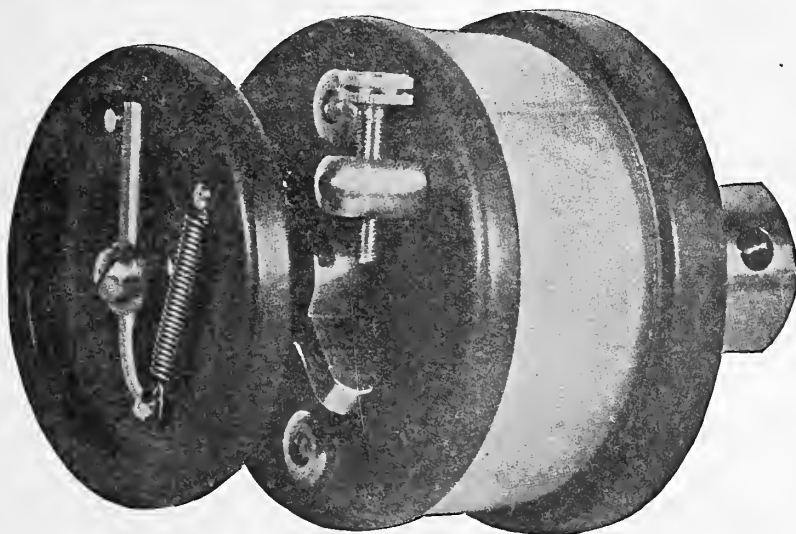
9. The height of flame in lamps is controlled by a quick-acting and positive hand adjustment screw; no tools necessary.

10. THE IDEAL is guaranteed for one year, when properly installed, to do all we claim for it, or money refunded.

11. THE IDEAL is a perfect, sure, automatic-lighter for Automobile Head lights and Gas Lamps.

12. It is a scientific combination of mechanical and electrical principles so nicely harmonized and perfected, that its perfect construction, simplicity, usefulness and economy of gas is at once recognized.

13. THE IDEAL is built in two types, "A" \$15 00. "AA" \$25.00, but both are sold under the same guarantee, the latter being more highly finished.



The IDEAL AUTO LIGHTER is not an experiment, nor a toy, but a remarkable, practical, scientific success.

Orders for 300 Ideal Auto Lighters taken on the opening day of the Buffalo Show, when it was shown for the first time in that city.

Let us tell you more about it. We will be pleased to send information

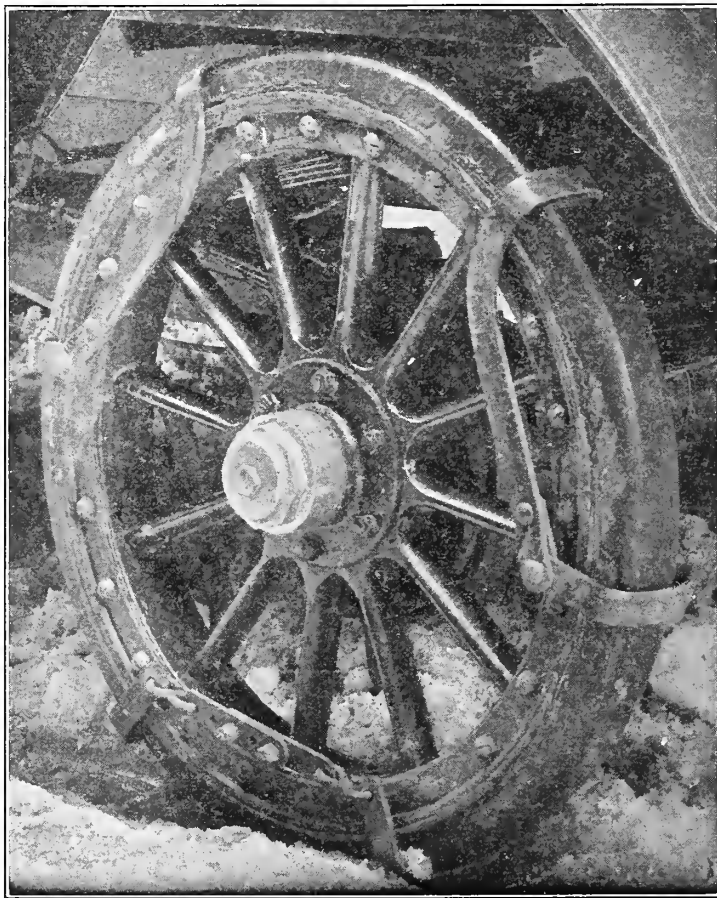
**U. E. LAZELLE & CO.,** *General Sales Agents* **Battle Creek, Michigan**

## *Important for Dealers*

Lyon Non-Skid Solid Tire Grips are the best selling grips for commercial vehicles on the market.

They outlast any other grip five to ten times. Easy to apply—Simple to adjust.

CUT SHOWS GRIP IN POSITION



(Patent June 15, 1909, other Patents Pending)

WRITE FOR PRICES

**LYON NON-SKID COMPANY**  
433 N. Broad Street      Philadelphia, Penna.



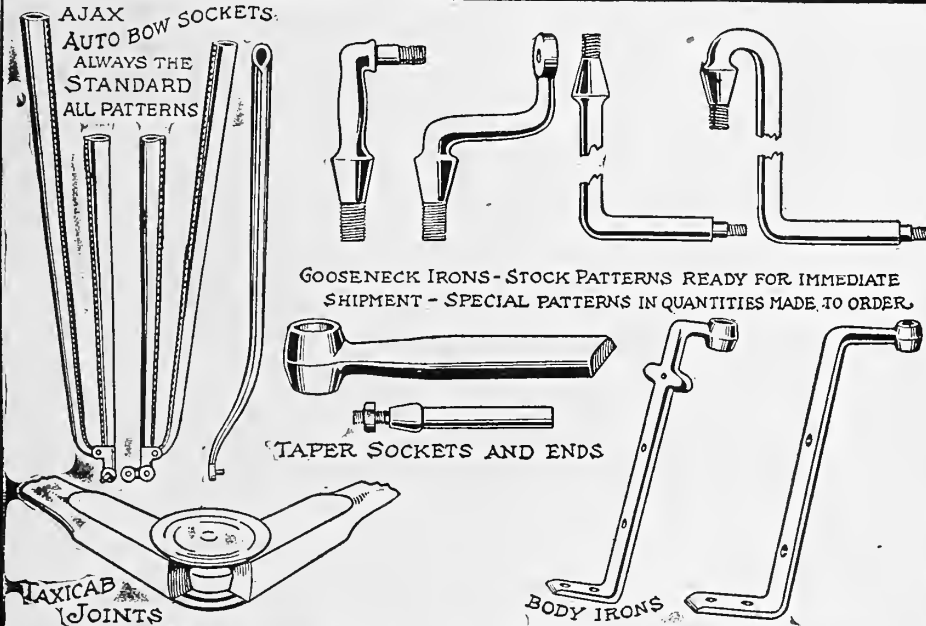
# Order STOCK SIZES of AJAX AUTO BOW SOCKETS FOR QUICK DELIVERY

We can ship IMMEDIATELY the following sizes:

Pattern No. 25—3 Bow DuQuesne	27-27-33 Straight
Pattern No. 30—3 Bow	33-26-32 Straight
Pattern No. 35—3 Bow	34-28-34 Straight
Pattern No. 40—4 Bow Extension	38-24-24-34 Offset 2 1-2
Pattern No. 40 A—4 Bow Extension	38-24-24-34 Offset 3
Pattern No. 40 B—4 Bow Extension	38-24-24-34 Offset 3 1-2
Pattern No. 40 C—4 Bow Extension	38-24-24-34 Straight
Pattern No. 41—4 Bow Extension	40-26-26-36 Offset 2 1-2
Pattern No. 41 A—4 Bow Extension	40-26-26-36 Offset 3
Pattern No. 41 B—4 Bow Extension	40-26-26-36 Offset 3 1-2
Pattern No. 41 C—4 Bow Extension	40-26-26-36 Straight
Pattern No. 50—4 Bow Extension DuQuesne	32-26-26-35 Straight
Pattern No. 45—5 Bow Extension	40-25-33-25-33 Offset 2 1-2
Pattern No. 45 C—5 Bow Extension	40-25-33-25-33 Straight

*Be sure to specify finish—Japanned or Leather*

**AJAX AUTO BOW SOCKETS.**  
ALWAYS THE STANDARD ALL PATTERNS



GOOSENECK IRONS - STOCK PATTERNS READY FOR IMMEDIATE SHIPMENT - SPECIAL PATTERNS IN QUANTITIES MADE TO ORDER.

TAPER SOCKETS AND ENDS

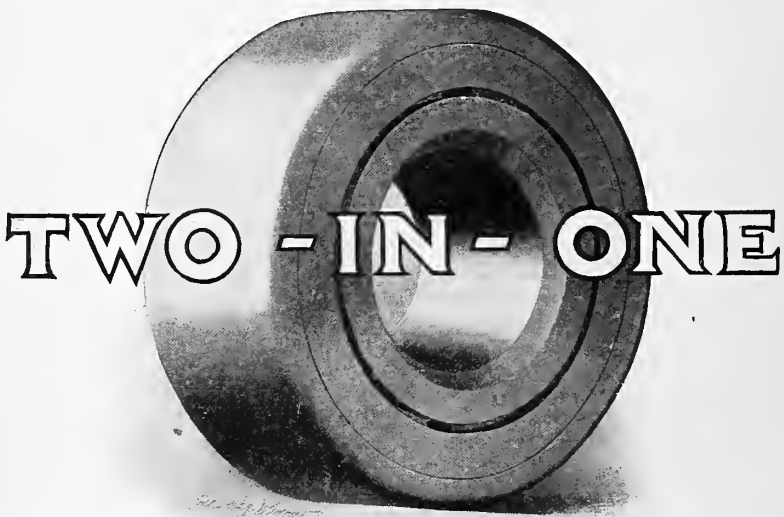
MAXICAB JOINTS IN PARTS OR FINISHED

BODY IRONS MADE IN QUANTITIES TO PATTERN

**CORTLAND FORGING CO.**  
CORTLAND, N.Y., U.S.A.

# NEW DEPARTURE Annular Ball Bearing

(Combined radial and thrust)



This is the bearing so many Automobile Manufacturers are using in their 1910 models—the bearing that is in demand.

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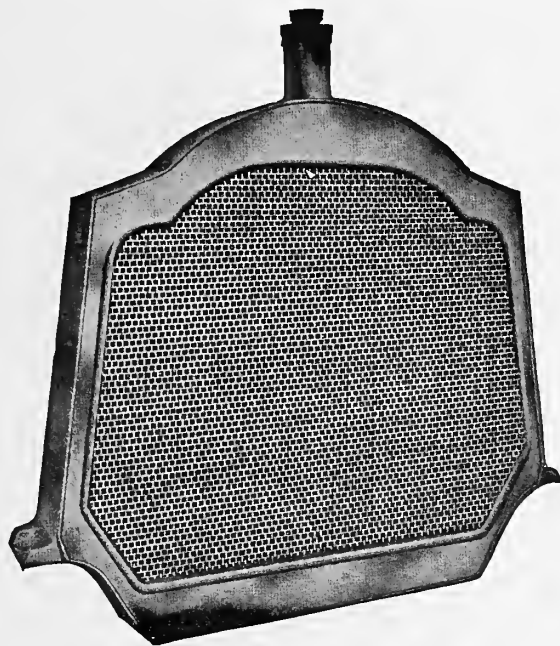
**The New Departure Mfg. Co.**  
BRISTOL, CONN.

# FEDDERS

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# RADIATORS

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The 'real square tube radiator—  
The New York to Paris Radiator

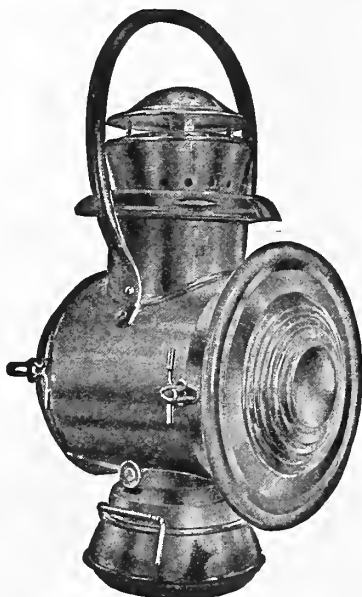
Will be very much in evidence on the LEADERS.

Look for them. Cut shows one.

You know the make.

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FEDDERS MFG. WORKS  
BUFFALO, N. Y.



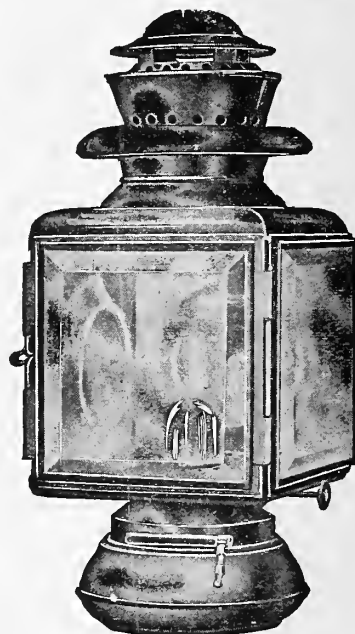
Ham's Tourist

Furnished to  
Burn Oil, Gas  
and Electricity.

**3 in 1**

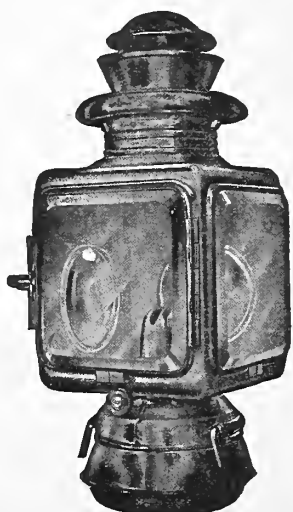
The Greatest  
Convenience  
Known.

GET OUR  
CATALOG  
ADDRESS  
"DEP'T D"



Ham's Rochester

# HAM'S "COLD BLAST" AUTOMOBILE LAMPS for 1910



Ham's Coupe

The Strongest,  
Handsome, Best  
Burning and Great-  
est Light Produc-  
ing Oil Lamps on  
the Market.

**C.T. HAM  
MFG. CO.**  
Rochester, New York



Ham's Venus

# LUBRICATION

¶ Every owner of an automobile appreciates the necessity of supplying his car with the best oil.

¶ Not one automobile owner in ten thousand knows anything at all about oil.

¶ As every manufacturer of oil claims his own to be the best, the subject is apt to appear confusing. It is the reverse. It is simple.



¶ A cylinder oil is required to do two things: (1) lubricate and (2) burn up cleanly. ¶ All first-class oils will lubricate, but very few will burn up cleanly—they contain too much carbon. Carbon is removed from oil by filtration, and the more completely an oil has been filtered the cleaner it will burn.

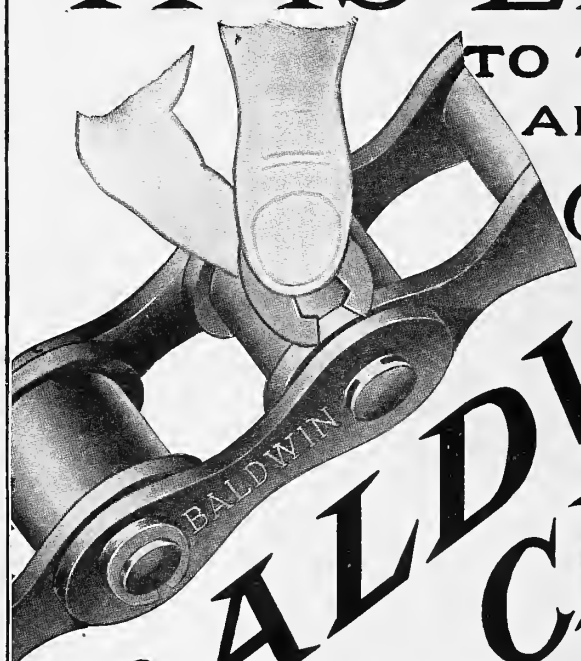
## “HAVOLINE” OIL

is the only COMPLETELY filtered oil made. That is why it is the best and that is why

*“It Makes a Difference”*



For sale at any first-class garage or supply house or at our branch stores in Boston, Chicago, St. Louis and San Francisco. Our main office is located at 79 Broad Street, New York City



**IT IS EASY  
TO TAKE  
APART  
A  
BALDWIN  
CHAIN  
AND  
JUST AS EASY  
TO PUT IT TOGETHER  
AGAIN**

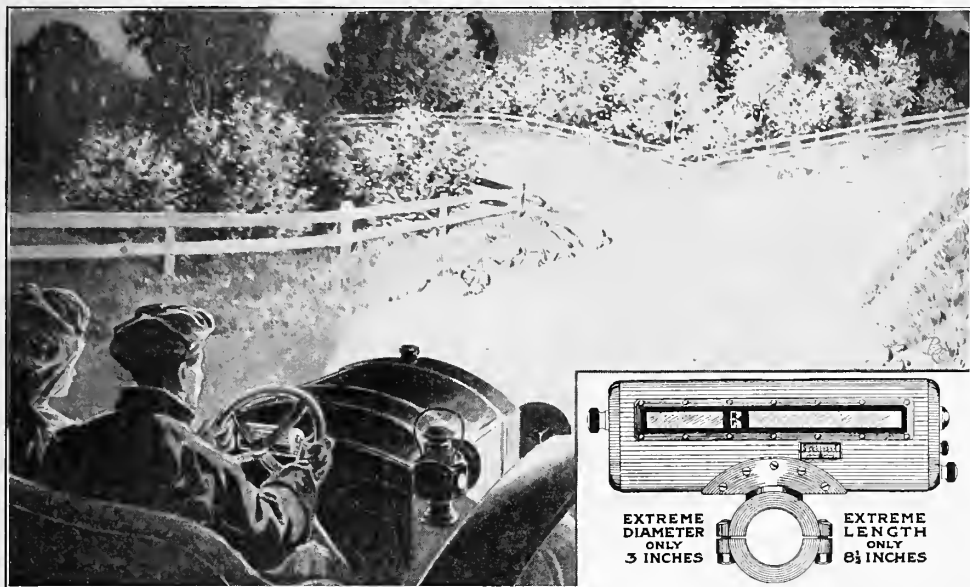
Buy Baldwin chains and be in good company. The following are a few of our customers: Buick Motor Company, International Harvester Company, Brush Runabout Company, Schacht Mfg. Company, Zimmerman Mfg. Company, Mack Bros. Motor Car Company, Motor Car Equipment Company, Adams Express Company, etc.

In emergency a wire can be substituted for the washer. This type of detachable chain is as durable as a riveted chain. Suitable especially for trucks. The new detachable feature is gaining favor and meets the demands of the trade.

**Baldwin Chain & Mfg. Co.**  
**WORCESTER, MASS.**

**AGENTS:** H. V. Greenwood, 166 Lake Street, Chicago, Ill.  
C. J. Iven, Rochester, N. Y.  
M. A. Bryte, 788 Mission Street, San Francisco, Cal.





# Which Way to Turn?

That is the question that the

## RHODES PATHFINDER

will answer for you, either by night or by day, with a signal at the approach of every turn telling you the right way. In fact, it is

### A Perfect Mechanical Road Guide

It uses no maps, printed tapes or paper discs; is absolutely reliable and accurate under all conditions. Is good for any route, and is quickly interchangeable from one route to another.

## THE RHODES PATHFINDER

is sold at a price within the reach of every automobile owner, and guaranteed for five years.

Write to-day for illustrated booklet and information, and be convinced that the Rhodes Pathfinder is all we claim for it.

### J. B. Rhodes Co.

610 Douglas Avenue

Kalamazoo, Michigan

HANDLED BY ALL LARGE DEALERS

DIETZ - RUSHMORE DIETZ - RUSHMORE DIETZ - RUSHMORE

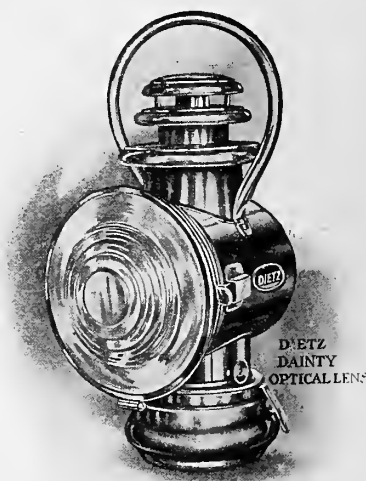
# L A M P S T H A T

## The Name "Dietz"

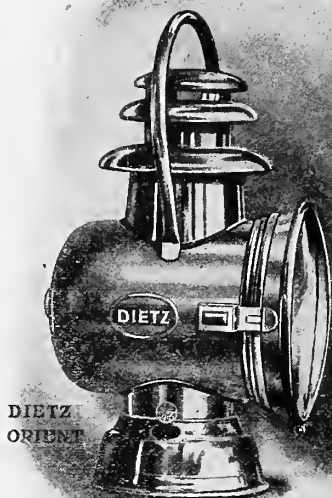
on an oil lamp stands not only for lighting efficiency, symmetry, and up-to-date design, but for rigid construction and ability to withstand the severe vibrations of automobile service.

Every motorist has seen (and heard) oil lamps which rattled loose in a season or two, and which thereafter no amount of soldering could make permanently snug. Such lamps are easy to sell to the novice, because they look much like the "real thing;" but they are a poor basis for a permanent reputation.

Dietz-Rushmore oil lamps are the product of a business that has been growing for seventy years, and that now owns two big factories with nearly 5 acres of floor space devoted to oil lamps and lanterns alone. *We could not afford* to put out lamps that were not the very best of their kind.



11½ in. high. Optical lens, 5½ in. diameter. Removable lens and reflectors and combination socket



12½ in. high. Plain lens, 5½ in. diameter. Removable lens and reflectors and combination socket.

## RUSHMORE DYNAMO WORKS

PLAINFIELD, NEW JERSEY

Chicago London Paris Manchester Dublin Berlin St. Petersburg Milan

DIETZ - RUSHMORE DIETZ - RUSHMORE DIETZ - RUSHMORE

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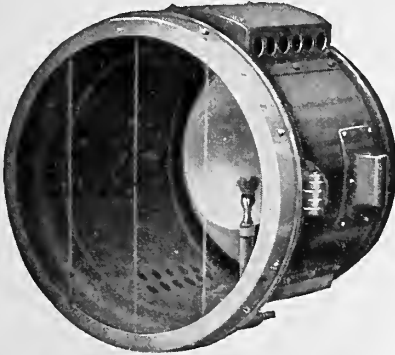
DIETZ - RUSHMORE DIETZ - RUSHMORE DIETZ - RUSHMORE

**STAY NEW!****UNTIL NOW—**

when a motorist wanted steady illumination at night he was compelled either to resort to inefficient, antiquated lamps, extravagantly wasteful of gas—

or to multiply the sources of light by adding a searchlight to the regular headlight equipment.

For a long range there is nothing like a searchlight, and we always recommend it. But the man who does not want to drive fast can now get perfectly steady light from the headlights alone, with no waste of gas, by using the new



Regular Headlight with flare front.  
Sizes 6 to 10 in.



Multiplex Headlight with flare front.  
Sizes 6 to 10 in.

## **Dietz - Rushmore Multiplex**

lens mirror lamps. Each lamp gives, instead of a single flickering beam, from four to six *overlapping* beams. Flickering of the flame simply transfers light from one beam to some other, and the total illumination is not affected. Price is only a little higher than the regular styles. Send a postal for catalog.

**R. E. DIETZ COMPANY**

60 LAIGHT STREET,

NEW YORK CITY

870 Woodward Ave., Detroit

118 Holborn, E. C., London

DIETZ - RUSHMORE DIETZ - RUSHMORE DIETZ - RUSHMORE

DIETZ - RUSHMORE DIETZ - RUSHMORE DIETZ - RUSHMORE DIETZ - RUSHMORE

# The Best Accident Insurance

A large percentage of motor mishaps at night are due to faulty lamps. The lamp either fails at a critical moment or there is a wavering or other fault in the flame which misleads the driver.



Solar Torpedo Headlight

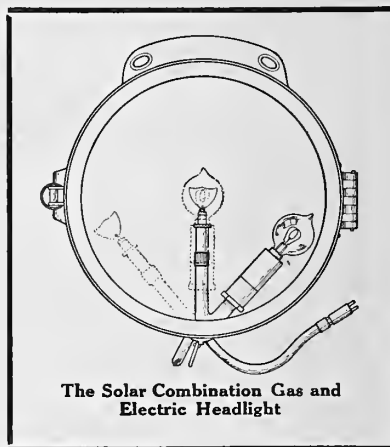
That's true of ordinary lamps. It is not true of

## SOLAR LAMPS

Solar Lamps are the best insurance you can carry against defective roads, converging traffic, or other sources of accident at night. Solar Headlights throw a stronger

beam, and throw it farther ahead than any other lamps made. They are constructed of heavy gauge drawn brass, with few parts, and those few assembled by interior screws, rendering cleaning easy. They are equipped with the special exclusive Solar B. & L. short focus lead glass lens mirror, the most efficient known.

Every Solar Lamp has a model number stamped on it, by reference to which it is easy to replace any part desired; all parts are interchangeable. They are absolutely reliable and dependable at all times. Solar side and tail lights are equally dependable, and of the same high quality. Motorists generally are coming to insist that their cars be equipped with **Solar Lamps or none.** Catalog telling all about them mailed on request.



The Solar Combination Gas and Electric Headlight

**Badger Brass Mfg. Co.** (68)  
 Kenosha, Wis. : : New York City

# HARD TO BEAT

That is what every user of NON-GRAN says, and there are reasons.

How much annoyance is caused during the course of a year by faulty bearings and bushings in connection with your repair business?

You can put a stop to this trouble by using NON-GRAN High Speed No. 8 Bronze.

NON-GRAN is the smoothest running bearing metal ever put on the market.

Its lasting qualities are phenomenal.

NON-GRAN saves itself and saves the parts with which it comes in contact, and it saves worry for you and your customer.

Automobile, motor cycle and motor boat manufacturers have adopted NON-GRAN exclusively on account of its uniform density and smooth running qualities which are the factors in long life and slow wear.

NON-GRAN Bronze in special repair shop bars, either solid or cored, furnishes a speedy and easy method of replacing any worn bearings.

Send for booklet describing NON-GRAN Cored-Bars. It gives complete list of sizes, dealers' discounts, etc. Be sure and send us your jobber's name if he cannot supply you with NON-GRAN.



---

**AMERICAN BRONZE COMPANY**  
BERWYN, PENNSYLVANIA

---

# Mobiloil

Makes Your Car Fairly Fly



•the oil that lubricates most•

**SOLD EVERYWHERE**

**Vacuum Oil Company**

**New York, U.S.A.**



# Mobiloil

Makes Your Car Fairly Fly



•the oil that lubricates most•

**SOLD EVERYWHERE**

**Vacuum Oil Company**

**New York, U.S.A.**

**We Want**  
**a Slogan**

**for the**

**"STAPLEY"**  
**TIRE PUMP**

**\$100 in Gold for the Best**

We will pay \$100 in gold for an effective Slogan to use when advertising the "Stapley" Compound Tire Pump. We want a Slogan that will tell what the "Stapley" is and what it does in as few words as possible. We have a Slogan now—"Stapley, the Time and Trouble-Saving Pump"—but we want a better one. Can you supply it? Submit as many Slogans as you desire. But first you must know the facts about the "Stapley." Here they are.

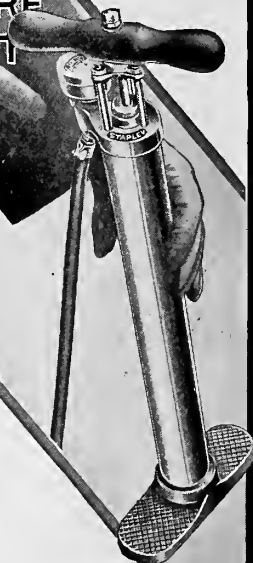
The "Stapley" Compound Tire Pump is very powerful. Inflates a tire in less time, with less trouble than any other. Has no complicated parts. Nothing to get out of order. Will not rust—seamless brass tube cylinders—not steel or cheap metal. Pressure gauge quickly and easily read. Automatic valve opener allows tire valve to close without ANY loss of air from tire. No leaky joints—pump cylinder is fastened to the foot base in such a manner that it makes an absolutely non-leakable joint—positively will not leak. Every "Stapley" guaranteed—buy a "Stapley today."

**Bridgeport Brass Company**

**106 Crescent Ave.**

**Bridgeport :: :: Conn.**

**THE NAME STAPLEY  
APPEARS HERE  
LOOK FOR IT**



Price, without gauge . . . . \$5.00  
Price with gauge . . . . . 7.00

**If your dealer doesn't carry the "Stapley" we will send it prepaid in the United States on receipt of price.**

Write Slogan on a postal card, in a letter, or in any form you desire, but we suggest using the coupon. If you drive a car please mention the fact. The contest closes May 1st. Judges are: J. H. Hildreth, of Motor; C. A. Musselman, of the Cycle and Automobile Trade Journal and H. H. Greene of this Company. Their decision is final.

**Winner of the Slogan Contest and the winning Slogan will be published in these columns when the judges have rendered their decision.**

**COUPON**

**T. J.**

**Bridgeport Brass Co.  
Crescent Ave.  
Bridgeport, Conn.**

**This is my suggestion for a Slogan advertising the "Stapley" Tire Pump.**

.....  
.....  
.....  
.....  
Name .....  
Address .....  
I drive a .....



# Kelly-Springfield

## Automobile Tires

We haven't made a poor tire since we began making rubber tires twelve years ago. That is why the strongest argument we can make for our automobile tires is to state that they are of Kelly-Springfield quality.

A set of Kelly-Springfield Tires have been run 6,000 miles on our testing car and show very little wear.

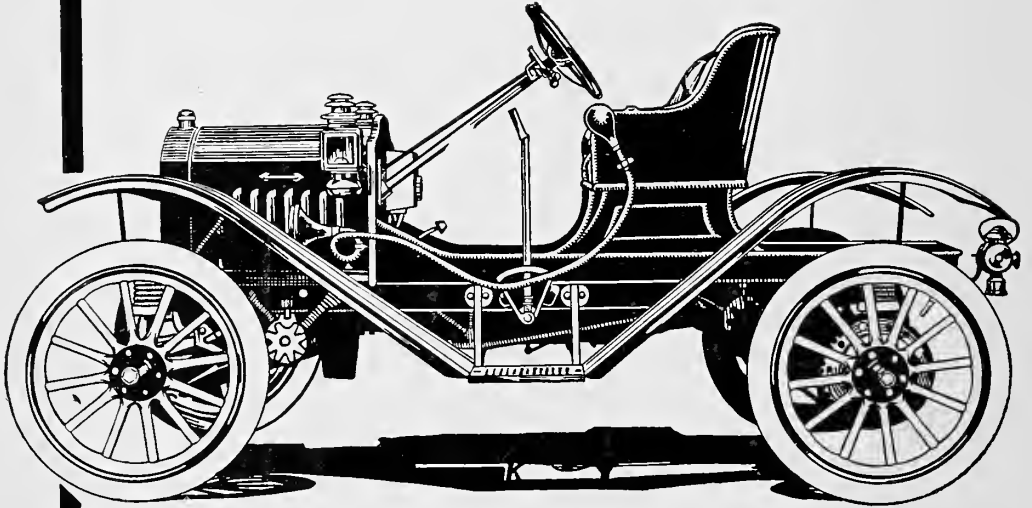
*—Imperial Automobile Company, Jackson, Mich.*

**Consolidated Rubber Tire Co.**

**20 Vesey Street, New York**

Branch Offices in New York, Chicago, Philadelphia,  
Boston, St. Louis, Detroit, Cincinnati, San  
Francisco, and Akron, O.

# Everyman's



Think of it---\$485 for the best-built, most thoroughly proven, easiest riding, most economical, handiest small automobile in the world!

*The New Brush Runabout* not only outclasses all small cars, but is far ahead of its own previous high standard.

Even though we have learned the lessons all manufacturers have to learn by experience—even though we have manufacturing facilities as nearly perfect as money and brains can make them—still we could not build a car of the quality of the 1910 Brush if we merely imitated the big cars with all their complicated parts and all parts necessarily smaller and weaker.

Here's where the genius of the designer counts

The Brush has always been and still is the only real Runabout built in America.

The new 1910 Brush is not a designer's dream but the result of years of experience and a knowledge acquired by manufacturing 3,000 Brushes that are in daily use. It is a car which with one chassis adapts itself perfectly by change of bodies to a hundred different uses.

It is a car new in power, smoothness, speed and looks, but built on proven principles by an organization already perfected.

The Brush has the fewest possible parts, but they are of sufficient size and strength to stand the hardest knocks.

*Simplicity* makes it possible to build the car right and still sell it at this wonderful price.

As for reliability, there is no comparison between the Brush and any of the small imitations of larger multi-cylinder cars.

With the new Brush you get single-cylinder simplicity, reliability, light weight, low gasoline and oil consumption, low tire expense with four-cylinder power and smoothness.

Its new balanced motor runs as quietly as a four-cylinder and is as flexible. Its power is astonishing.

The most wonderful improvement in Motor Car Construction in years.

While the balanced motor is the most remarkable feature of the 1910 Brush, we have made numerous other improvements and refinements.

Here are some of them: wheel-base lengthened 6 inches; more graceful and rakish lines; Mercedes type radiator; new selective control; universal coupling-shaft; improved dust-proof commutator; multiple disc low and reverse clutches; transmission control levers entirely housed and oil-tight; more quiet muffler.

In our magnificent new plant we make every part of the Brush except the wheels, tires and electric equipment. The Brush buyer pays no middleman's or parts-maker's profit.

# Car at Last 1910 BRUSH

## \$485<sup>00</sup>

### Read the Specifications

**Motor**—10 Horse-Power, *balanced* single cylinder, four-cycle, vertical, 4" x 5", water-cooled; located in front under hood; every part instantly accessible; three point suspension.

**Balancing**—After balancing by the usual counter-weights, one extra loaded balance gear, driven by a crankshaft gear, is applied, the result of which is to take out *all* of the vibration due to reciprocating weight and in addition *most* (or at times *all*) of the torque vibration—theoretically *in better balance than a four-cylinder motor*.

**Transmission**—Internal gear type, perfectly quiet; entirely enclosed and absolutely oil-tight.

**Cooling**—Mercedes type radiator, on Briscoe thermo syphon system, eliminating pump.

**Drive**—Double side chains to rear wheels.

**Control**—Single hand-lever of selective action for all speeds; spark and throttle under steering-wheel; foot-pedal releases clutch without touching the hand-lever, and also applies the brake. This clutch released by the foot is one of the fine features of the Brush and is found on no other low-priced car.

**Steering Gear**—Another exceptional feature; internal reducing spur gear, slow and powerful at straight-ahead and accelerating as the wheel turns, entirely enclosed and oil-tight.

**Axles and Frames**—Oil-treated, selected wood, oak, hickory and maple; wonderful for strength, durability and lightness.

**Springs**—Spiral, located at extreme four corners; absolutely the easiest riding springs on any car and mechanically impossible to break.

**Brakes**—Internal expanding in rear sprocket hubs.

**Wheels**—Artillery, with 28" x 3" pneumatic tires.

**Wheel Base**—80 inches.

**Tread**—56". For Southern trade, 60".

**Equipment**—Tools, tire kit, 3 oil lamps, horn.

**Color**—Maroon, except coupe.

**Body**—Divided seat; trimmed in high-grade leather. Platform on rear, as pictured on opposite page, with equipment, \$485.00.

Six special bodies, furnished on order, at extra prices, as follows: rear platform with steel tool box; rear compartment with removable steel deck; single or double rumble with wooden tool box; racer type; coupe.

**Speed**—35 miles an hour, except racer type which has especial gearing.

MAIL THE COUPON TO-DAY

## Brush Runabout Co.

212 Baltimore Ave.

DETROIT MICH.

C. & A. 12

BRUSH RUNABOUT CO.

212 Baltimore Ave., Detroit, Mich.

Please send me a copy of the advance Brush Catalog.

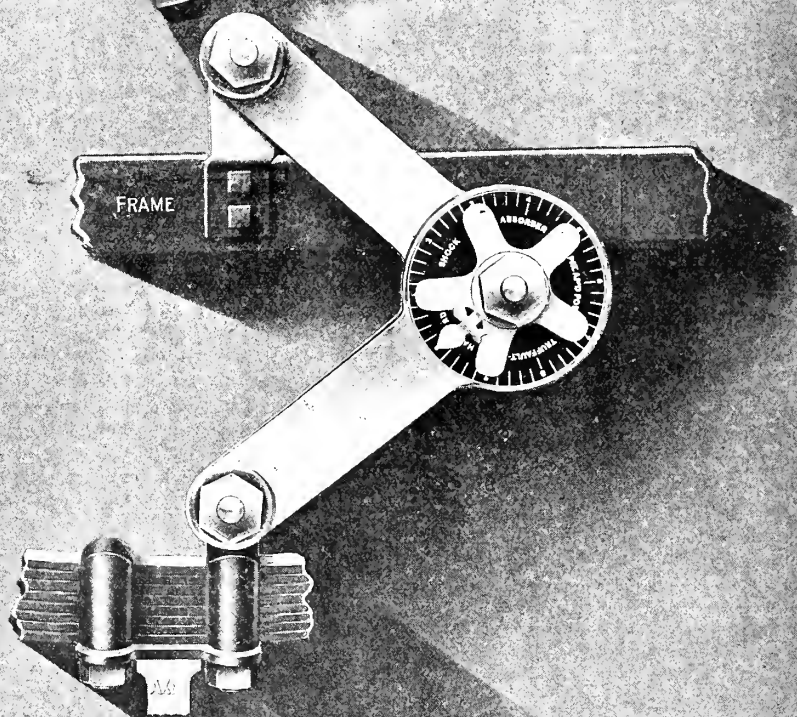
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# TRUFFAULT- HARTFORD

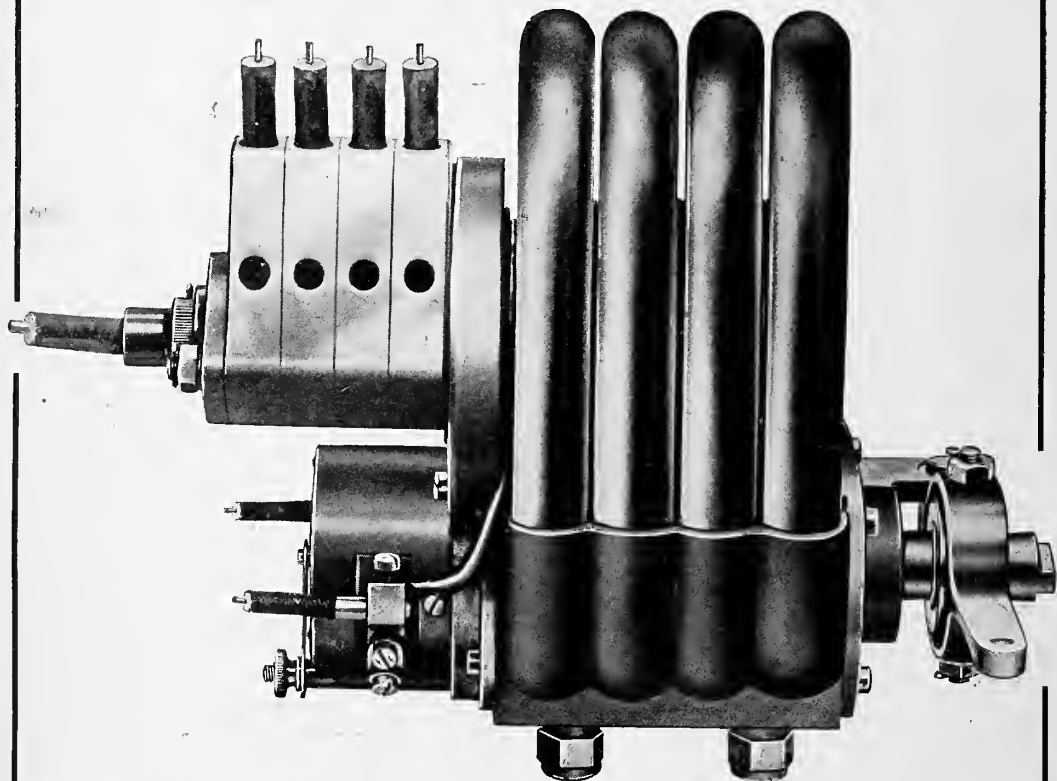


## SHOCK ABSORBER



**MAKES  
ALL  
ROADS  
SMOOTH  
ROADS**

# HEINZE



## Why Our Magneto is Superior to all Others

**Because** We get over 100% more electricity per pound of magnet steel than is possible in any other magneto.

**Because** We use the highest grade annular ball bearings which are self-lubricating, requiring no attention.

They are superior to the separable or common bearings.

**Because** The common bearings are continually getting out of alignment, run dry, thereby causing excessive friction, wear off and in a short time the armature will rub against the pole pieces of the field and your magneto is ruined.

## Our Armature Advance is a Decided Improvement

**Because** We advance the peak of the wave rather than advance the spark by the make and break. The latter while producing an earlier spark the amount which this tends to speed up the engine is neutralized by the weaker spark which reduces the speed of the engine and the result is but a very slight advance in engine speed, whereas, by our armature advance we get the maximum efficiency at any speed.

## Get the Heinze Magneto

**Because** The foremost ignition experts in this country have decided in its favor, and lastly

**Because** We furnish a positive guarantee that it will make good or refund the purchase price.

**Heinze Electric Company, Lowell, Massachusetts**

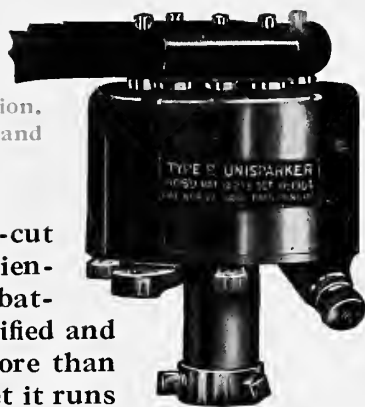
# The Simplicity of the Atwater Kent Unisparker

## Type "B"

Is not limited to its mechanical construction.  
It extends to its installation, adjustment and care.



THE UNISPARKER is a short-cut to ignition reliability—a scientific system of using dry batteries for current, so simplified and refined that it costs no more than ordinary coils and timer, yet it runs



with the unfailing, unostentatious regularity of a good watch.

Its principle is to produce one instantaneous contact per explosion. The duration of contact is not affected by the speed and is adjustable to suit the freshness of the battery.

The UNISPARKER takes the place of the ordinary timer and distributor, and it is attached in the same way. There is nothing to adjust save the contact screw, and that is not delicate; it is set with the engine running, and given a quarter turn every 500 to 1000 miles. Nothing but the contacts can wear out; they last 10,000 miles and cost \$1.25 to renew. A drop of oil every 500 miles and battery renewal every 2000 miles complete the list of attentions required.

For the rest—nothing—absolutely nothing. The UNISPARKER cannot wear out or forget to operate. When the battery is nearly spent, it warns of the fact by slight misfiring. A half turn of the contact screw makes it good for a hundred miles further. You cannot be stranded by unforeseen loss of current.

No other ignition system gives nearly the results of the UNISPARKER at the UNISPARKER'S price.

### PRICES OF THE TYPE "B" UNISPARKER

	Standard Coil Box	Kick Switch Coil Box
1-Cylinder, without distributor . . .	\$18.00	
2-Cylinder, " " (opposed) . . .	20.00	
2-Cylinder, with distributor . . .	27.00	\$30.00
3-Cylinder, " " . . .	30.00	33.00
4-Cylinder, " " . . .	30.00	33.00
6-Cylinder, " " . . .	32.00	35.00

## Atwater Kent Manufacturing Works

41 North Sixth Street, Philadelphia, Pa.



This type "A" Vanadium Steel Crank Shaft stood repeated blows of 2500 pounds under a steam hammer with no sign of fracture at any point. A .35 carbon steel of excellent quality failed under the same test.

# VANADIUM

The superiority of Vanadium Steels rests in their ability to meet the most trying kinds of service without deteriorating.

The conditions under which this test was made would never occur in actual service. Due to shock and impact, it is much more severe than one made under the gradual pressure of a hydraulic press.

The tensile strength of this shaft is 123,070 pounds to the square inch. Its elastic limit is 106,233 pounds. In spite of these figures the steel is easily machined, ductile, and works comparably with soft open hearth steel.

Other types of Vanadium Steels are made for gears, axles, springs, cutting tools, and forgings. Vanadium is also applied to iron and steel castings without special equipment. Booklets on request.

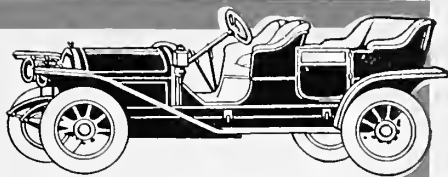
**The American Vanadium Company**

**323 Frick Building**

::

**Pittsburgh, Pa.**

# Just out of the Band Box



A "BUCKEYE CLEANSER" bath always gives your car that spick and span "just-out-of-the-band-box" appearance that is the delight of every car owner.

## Preserves the Finish

It really does. It's these strong alkaline soaps that kill the finish of your car. Be sure you're getting a strictly neutral soap. You can be positive of it when you buy "BUCKEYE." It's as harmless as clear water—not even a trace of alkali in it.

## Restores the Lustre

When you come in from a run and your car is dusty and muddy—full of dirt, grease or grime—give it a "BUCKEYE" bath and see how quickly and nicely it restores the lustre. It makes the car look like new and the beauty of it is—you can wash the car as long as the car lasts and "BUCKEYE Cleanser" will never injure the finish.

## Sold in 6 Different Packages

Barrels,	450 lbs.	25 lb. pails
Half bbls.,	225 "	10 "
Kegs, -	125 "	5 "

## To the Car Owner

All we ask of you is to give "BUCKEYE Cleanser" a good trial. Ask your supply dealer for "BUCKEYE" and don't take a substitute. If your dealer doesn't carry "BUCKEYE" in stock, write us—we'll see that you are supplied by the nearest dealer. Write for sample anyway—we want you to try it.

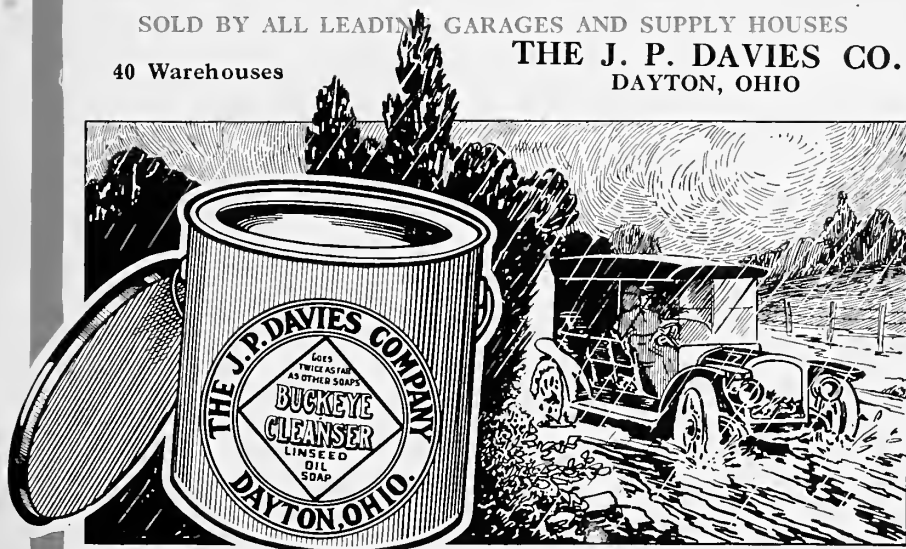
## To Dealers and Garages

Write for samples, prices, nearest warehouse and a special proposition we want to make you.

SOLD BY ALL LEADING GARAGES AND SUPPLY HOUSES

40 Warehouses

**THE J. P. DAVIES CO.**  
DAYTON, OHIO



# The Automobile Dealer and Garage Man Will Find

## THE *April Number* OF THE

### MOTOR CYCLE, MOTOR BOAT & **AUTOMOBILE** **TRADE DIRECTORY**

(Published Quarterly in Philadelphia)

to be the most accurate and valuable issue we have  
yet produced.

*It Will be Issued About April 15th*

If you are not a subscriber to this valuable book of  
information, better subscribe at once.

Single Copies	-	-	-	\$1.00
Years' Subscription (4 numbers),	2.00			
5 Years' Subscription	-	-		7.50

**Special Offer** A sample copy will be mailed free to anyone  
engaged in the automobile, motorcycle or motor  
boat industry on receipt of their request on business stationery, ac-  
companied by their business card, provided we have any left after  
supplying subscribers.

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# The Great Information Combination for Automobile Tradesmen

CYCLE AND  
**AUTOMOBILE**  
TRADE JOURNAL

Published Monthly in  
Philadelphia

MOTOR CYCLE, MOTOR BOAT &  
**AUTOMOBILE**  
TRADE DIRECTORY

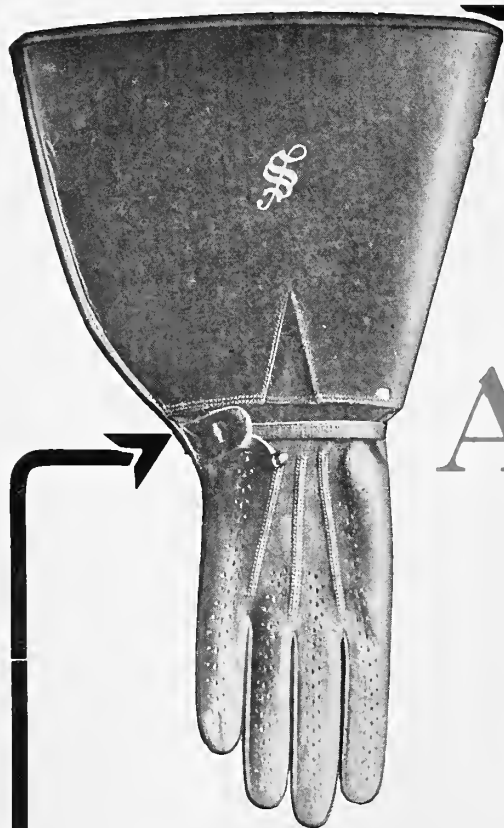
Published Quarterly in  
Philadelphia

## *These Two Publications*

contain just the information which every live man in the industry wants. This issue of the CYCLE AND  
AUTOMOBILE  
TRADE JOURNAL speaks for itself. The Directory must be seen to be appreciated. It is an immense volume and contains much valuable information outside of its directory features.

We Make a Special Combination Offer of These Two Publications as follows:

<small>CYCLE AND AUTOMOBILE TRADE JOURNAL</small>	and	<small>MOTOR CYCLE, MOTOR BOAT &amp; AUTOMOBILE TRADE DIRECTORY</small>	both for 1 year, \$ 3.00			
"	"	"	"	"	2	" 5.00
"	"	"	"	"	5	" 12.00



# Grinnell "Rist-Fit"

## Auto Gloves



### The Standard of Quality in Automobile Gloves

One pair will make you a constant wearer,—they contain so many **unusual** features of comfort and distinctiveness. **The Patented "Ristfit" V** keeps the stiff cuff from sagging down over the hand. The ventilated back makes them cool and comfortable, the gold initial gives them a touch of exclusiveness. Inspect the **Grinnell** line before you buy another pair of gloves.

**Mr. Dealer:**—You are losing an opportunity if you are not carrying **Grinnell Gloves**. Write **today** for price-list and dealers' proposition.

**MORRISON-RICKER MFG. CO.**  
70 Broad St., Grinnell, Ia.

**ALL THAT THE  
NAME SIGNIFIES**

**THE CAR  
COMPLETE**



To Ride in the  
Standard Six—the  
Car of Continuous  
Power—gives one  
the Feeling next to  
Perpetual Motion

**\$3,000**

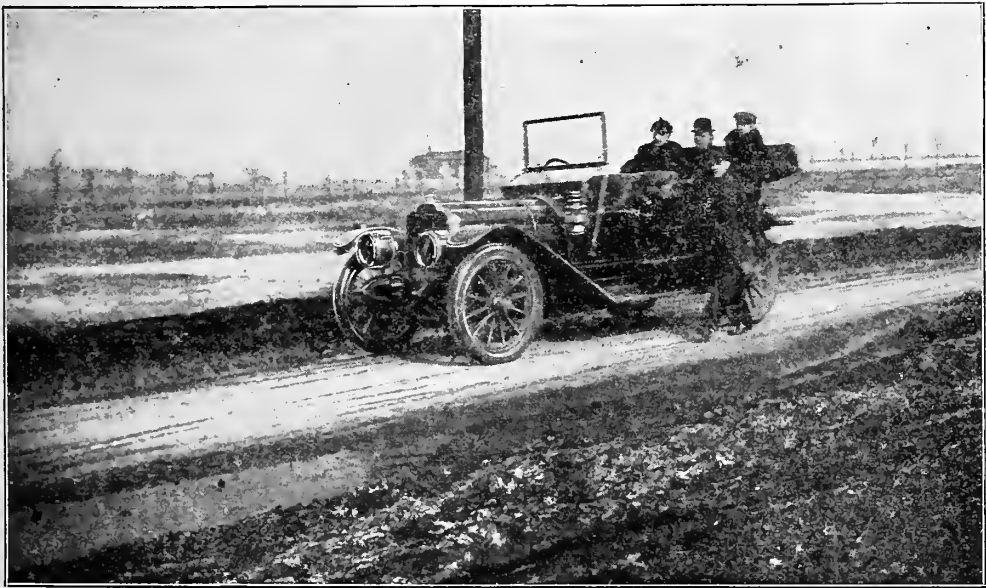
IN EITHER MINIATURE TON-  
NEAU, TOURING OR ROAD-  
STER BODIES, INCLUDING

**FULL EQUIPMENT**

**LUXURIOUS LIMOUSINE, \$4,000**

Continuous Power and Perfectly Even Torque in the STANDARD SIX are so Unremittent that it  
is Possible to Run this Remarkable Car

**ON HIGH GEAR, THROTTLED DOWN TO  
FOUR MILES PER HOUR**



This Illustration Shows the STANDARD SIX Running on High Gear Throttled Down to 4 Miles per Hour

**WITH DRIVER WALKING ALONGSIDE CAR**

**STANDARD SIX IS FAMOUS FOR ITS BROAD RANGE OF CONTROL—  
4 TO 65 MILES PER HOUR ON THE HIGH GEAR**

*Agents wanted in unassigned territory. Write for our handsome catalog, giving full details.*

**ST. LOUIS CAR CO. (AUTOMOBILE DEPT.) 5211 N. SECOND ST., ST. LOUIS, MO.**

**SUCCESSFUL STANDARD AGENTS:**

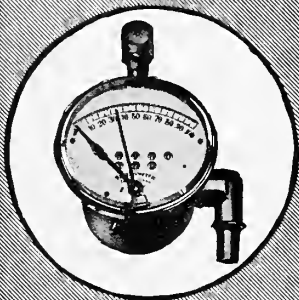
Standard Motor Car Co. of Massachusetts, Motor Mart, Park  
Square, Boston, Mass.  
J. E. Bailey, Pensacola, Fla.  
Standard Automobile Co., 3324-26 Main St., Kansas City  
W. W. Wilkerson & Sons, 117-119 Union Ave., Memphis,  
Tenn.  
Geo. C. John, 1706-18 Broadway, New York City

Standard Automobile Co., 1326 Michigan Ave., Chicago, Ill.  
W. W. Shuler & Co., Oklahoma City, Okla.  
Standard Automobile Co., 2024 Farnam St., Omaha, Neb.  
The Davies-Jung Co., Los Angeles and San Francisco  
Southern Auto & Equipment Co., 64 S. Forsyth St., Atlanta  
Caldwell Motor Car Co., Bainbridge, Ga.  
Evans, Hewes & Evans, Salt Lake City



## This Is Equipping Season STANDARD

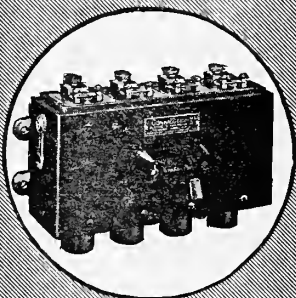
Surely you need one or all of the famous accessories illustrated on this page



### JONES SPEEDOMETER

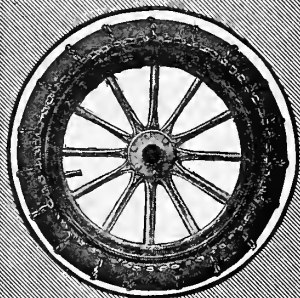
If you want real, permanent accuracy you've simply got to have a Jones. Why? Because the Jones is absolutely "Geared to the Truth." Other speedometers depend on a magnet to pull the indicating hand around to the point that shows the speed. You know how delicate and uncertain a magnet is. With the Jones the speed is transmitted from wheel to dial by metal-to-metal shaft and gear connection that can't vary—can't weaken. The Jones is absolutely accurate.

The Jones Yobel—the best automobile signal in the world.



### CONNECTICUT IGNITION

If the word "Connecticut" appears on any part of your ignition apparatus you can rest assured that you have the best that the industry produces. Ask any experienced motorist, dealer, manufacturer, what ignition apparatus is best and you'll get this answer—"Connecticut." The best costs no more than the unreliable kind—not a bit—so when you want a coil, a timer, a steering wheel switch, a volt-meter, terminals, or anything in the ignition line, ask for "Connecticut"—your ignition troubles vanish. A strong claim, but true.



### WEED ANTI-SKID CHAINS

Of course, everybody knows that Weed Chains are the only real, practical anti-skidding device. No question about that—but there is a question about the inefficient imitation of the famous Weed Chains now on the market. There's only one way for you to protect yourself from the imitation—insist upon getting **Brass Plated Cross Chains** when you ask for "Weeds." A further protection is the word "Weed" stamped in the hooks. Size is also stamped on the connecting hooks, making identification easy. Buy "Weeds" to-day. You've got to have them.

UNITED MANUFACTURERS, 76th St. and Broadway, New York

# Now Is the Time EQUIPMENT

To bring your car up to its maximum efficiency use these products.



## MoToRoL

MoToRoL for cylinder lubrication had to be a better lubricant than any other oil to satisfy motorists who demand the Non-Fluid Oil Standard of Economy and Efficiency. We examined other oils and only produced MoToRoL after we had discovered a means of making a better oil by eliminating carbon without excess filtration; by securing proper balance between flash point, cold test and viscosity; by eliminating all acid ordinarily present in oils; and by testing our product in actual service. If you use MoToRoL you get more power, more speed, and more miles from a given quantity of gasoline and more miles from every gallon of oil.



## NON-FLUID OILS

are best for your car because they keep it at its best longest, at the least cost. The manufacturers of the Sharp-Arrow ran a demonstrating car 20,000 miles and, (they said) 'Without showing any wear in those parts where Non-Fluid Oil was used.' Which adds one more car manufacturer to a list of over sixty who use Non-Fluid Oil and recommend it to their customers because it lubricates most at least cost. Every dollar spent for Non-Fluid Oil saves five for repairs. When you ask for it, stick to your request. Packed in orange-colored cans bearing this trade mark

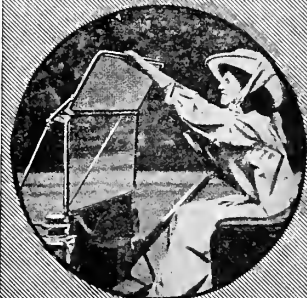
**NON-FLUID OILS**



## MEZGER AUTOMATIC WINDSHIELD

Up or down in a jiffy. Don't stop your car. No set-screws to tinker with. You simply lift it up and it locks itself upright. A slight pull with one hand puts it down against the rubber bumpers where it rests—firm, noiseless. It is always ready and always works. The Mezger Automatic is made of finest polished French plate glass and brass tubing. The glass rests against heavy piano felt inside a bronze channel—free from the vibrating and jolting of the car.

**Soot-Proof Spark Plug.** You can't short-circuit a Soot-Proof.



**UNITED MANUFACTURERS, 76th St. and Broadway, New York**



## HOPWELL BROTHERS

Manufacturers of Auto Fabric Specialties

NEWTON, MASS, U. S. A.

### Kinder Tire Case

#### The Perfected Button Cover

Case buttons at ends only, and thereby saves tedious buttoning around circumference, as in other makes. Through an overlap, case fits all makes and treads of tires.

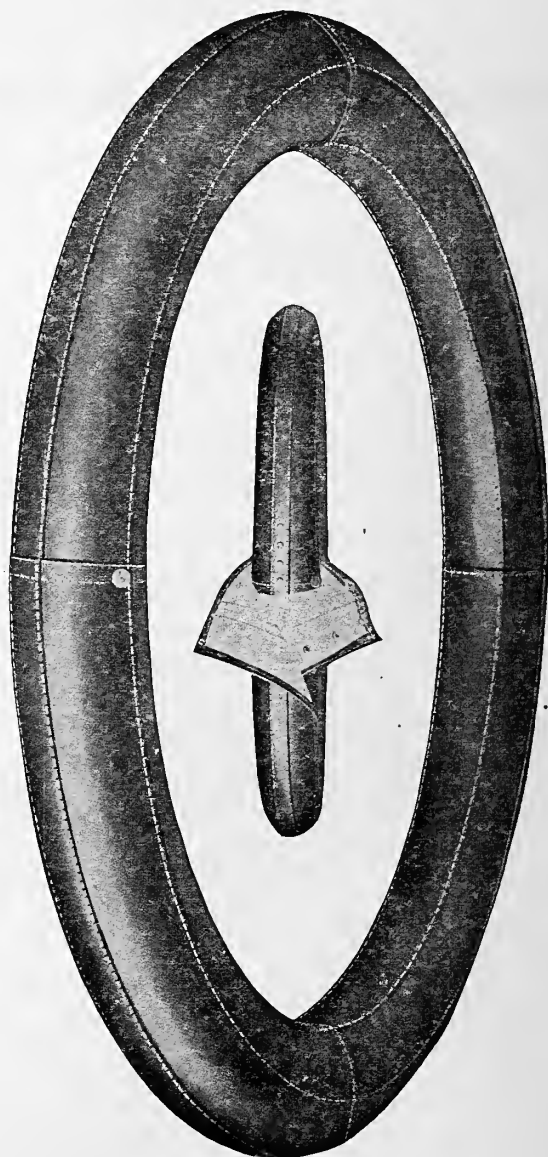
PRICE IN  
DUCK - - **\$2.00**

\$15.00 per Dozen

PRICE IN  
DRILL - - **\$1.50**

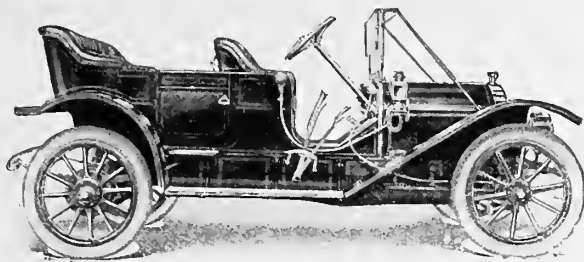
Price per Dozen, \$12.00

Dealers and Jobbers Send  
for Quotations



We Manufacture the Hopewell Tire Case,  
which is the Recognized Standard Tire  
Cover and also Perfect Fitting  
Lamp Covers.





## This \$1,800 Car Has Accomplished Wonders!

The great reserve power and perfect performance of the 1910 Model L. Midland, under conditions of the most extreme severity, made it the wonder of the Munsey Reliability Run and the Philadelphia-Seattle Relay Race.

The "Midland" System of Unit Power Plant with its three point suspension is one of the main reasons for the Midland's superiority. It positively eliminates all undue friction from the twisting of the frame on rough or uneven roads and insures the perfect alignment of the driving elements against every strain.

The 40 H. P.

# MIDLAND

1910 Model L

**Motor:**—40 Horse Power, four cylinders,  $4\frac{1}{2}$ " x 5", cast double. "T" head type with large valves on opposite sides operated by solid drop forged cam-shafts.

**Lubrication:**—Lubrication by shaft driven gear-pump insuring positive lubrication.

**Transmission:**—Transmission fitted with Timken Roller Bearings and is oil-tight and dust proof. Gives three speeds forward and reverse.

**Axles:**—Straight line shaft-drive to full floating axle. Imported extra large balls used throughout front and rear axles and wheels.

**Tires:**—Extra quality, 34" x 4" tires, wheel base 115".

**Springs:**—Rear springs,  $\frac{3}{4}$  elliptic 44 inches long. Front springs semi-elliptic, 40 inches long.

**Brakes:**—Two complete sets brakes, internal acting, and fully protected from dust and mud.

**Ignition:**—Remy system of dual ignition. (Includes batteries.)

**Body Styles:**—The 1910 Model "L" Midland can be furnished with either a five passenger touring car body, or a four passenger toy tonneau—both of straight line design and richly finished. A two passenger roadster with racy type of body. Gasoline tank of exceptional size and design is also furnished.

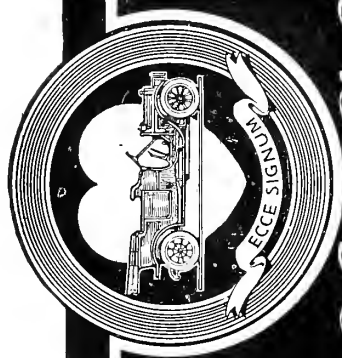
**Color:**—Standard color for all models is Brewster green with straw color running gear.

Write for our Illustrated Catalog and Nearest Agency

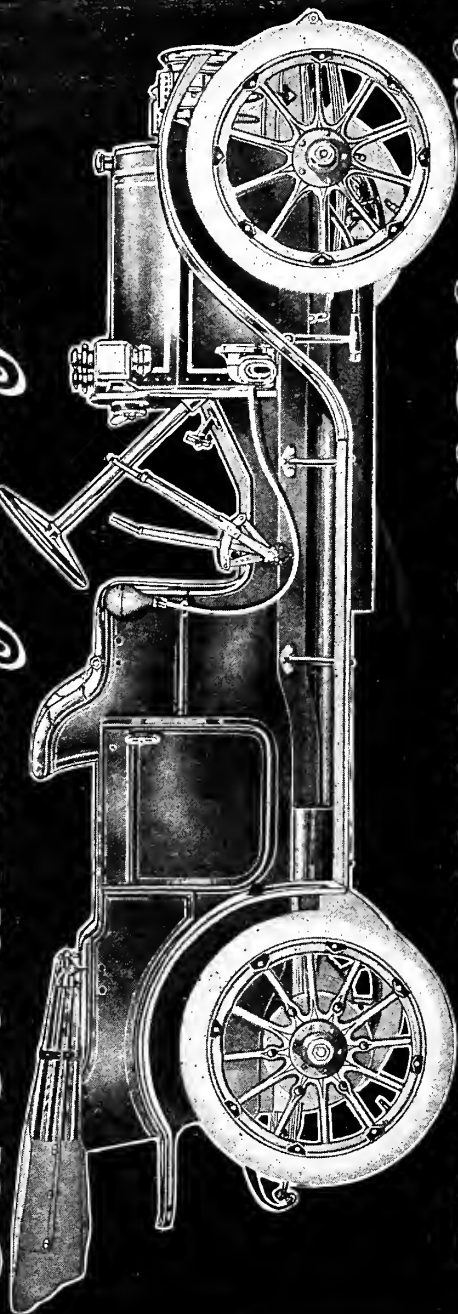
## MIDLAND MOTOR COMPANY

MOLINE, ILLINOIS





*First in the field for 1911*



*The Beautiful Carhartt Automobile*

*The last word in Motor Car Construction  
Makes all other automobiles back numbers*

**\$2250**

*The buyer gets all that can be given  
in a pleasure car at any price  
and 25% more than in any car now  
made at anywhere near the price*

*Power is there;  
Stability is there;  
Durability is there;*

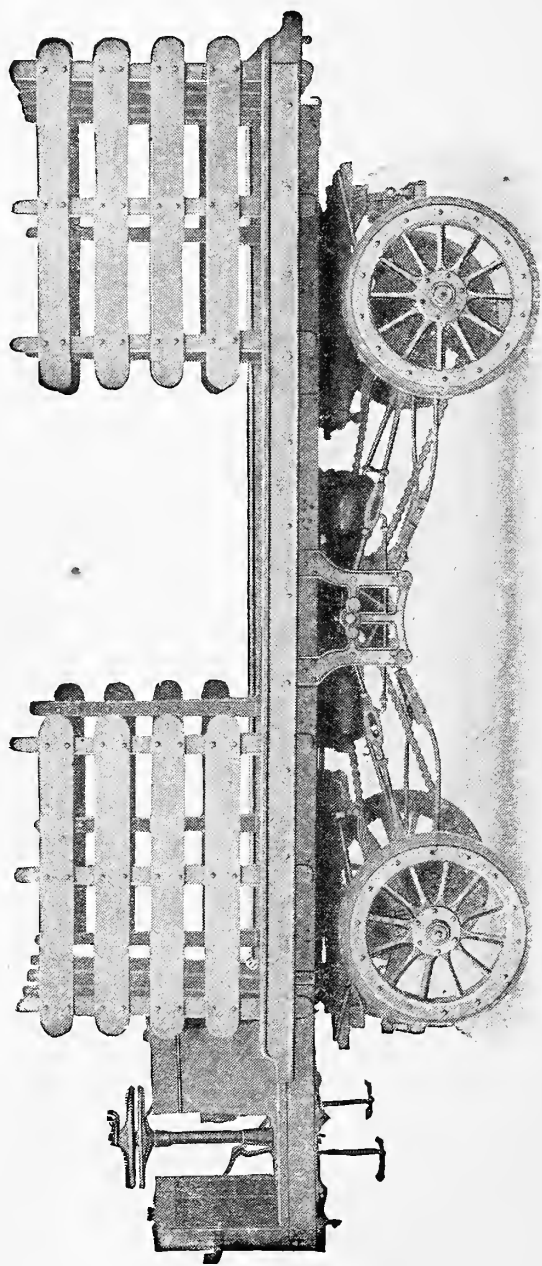
*Speed is there;  
Economy is there;  
Reliability is there;*

*And last but not least  
Beauty is there.*

*"A thing of Beauty is a joy forever"*

*Demonstration Cars June 1<sup>st</sup> Regular Delivery July 1<sup>st</sup>  
Write for Specifications and unassigned Territory*

*The Curshaw Automobile Corporation Executive Offices Suite 902  
Hamilton Capital Bldg. Press Union Trust Building  
Hamilton, Capital Bldg. U. Press, East Mgr. Works, Jefferson & Townsend Aves.  
Rifolo J. Brown Secy. Detroit Michigan, U.S.A.*



Agents wanted for a perfectly designed---superbly constructed  
Commercial Truck. Write to the

**AMERICAN MOTOR TRUCK COMPANY**  
306 TOLSON BUILDING, DETROIT, MICH., U. S. A.

# Our Many Claims of Superiority over all other makes of Heavy Trucks

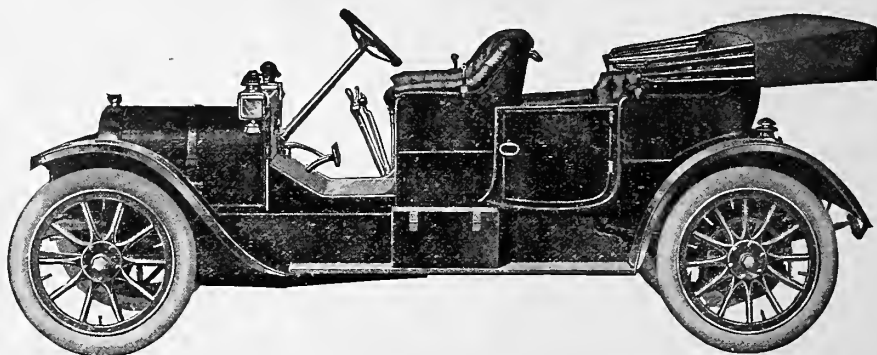
- 1st. Our method of power application enables us to overcome the torsion of the Motor, which always tends to produce a tangential strain, thereby furnishing sufficient adhesion to drive ahead without unduly absorbing power in overcoming the tendency to slip on an imperfectly resistance Road Bed.
- 2nd. Our Front and Rear Axles are duplicates of each other and are interchangeable.
- 3rd. The entire force exerted by the Motor, is equally distributed to all four wheels, leaving no friction resistance on the wheel bearings, except that caused by gravitation.
- 4th. We can run our car right or left, oblique forward or backward by manipulation of steering wheels.
- 5th. Our Five Ton Truck can handle one Ton just as cheap as any one Ton capacity Truck on the market, and can then handle Five Tons cheaper than any other Truck on the market.
- 6th. The driving of Front and Rear wheels effects over 50% saving in the wear and tear of tires, all the friction being eliminated from them. That means something.
- 7th. The principal feature of our invention resides in the means whereby the driving connection can be uniformly maintained at the same time during all the various shifting movements incident to ordinary service.
- 8th. Our worm gear and nut feed on the hounds making the shifting of the wheels impossible when coming in contact with stone, deep ruts or any foreign substance.
- 9th. The Patent "Universal Joint," the main object of our improved driving and steering mechanism, so constructed and arranged that the Axles can readily and conveniently be shifted in turning without interfering in the least with the alignment of the driving sprockets.
- 10th. Our Motor, stationed central of the wheel base, we drive direct to Front and Rear Axles, doing away with all jack shafts or sliding gear transmissions, which is an extra cost to keep up and something the majority of other Trucks have to have.
- 11th. All four wheels are interchangeable. Front and Rear hubs are made of Crucible Cast Steel, bored and reamed to one standard size, in this case an extra wheel would save all loss of time in case of any accident, as the wheels can be easily removed and replaced by others.
- 12th. Our Platform Gears are interchangeable, Front and Rear all being exact duplicates.
- 13th. Our patent King Roller Bearing Circles enable us to turn both Rear and Front Wheels 35 degrees each way, making it possible to turn our trucks round in half the space required by other makes of Trucks.
- 14th. But the one crowning point of our Truck over all others is on the ice and in the deep snow, there being no friction resistance and all wheels driving we are able to handle just as large a load in the winter without difficulty as in the summer.

**The American Motor Truck Company, 306 Tolsma Bldg., Detroit, Mich., U. S. A.**

# The White Gasoline Car

is equipped with a

## Four-Speed Transmission



**D**O not be satisfied with anything less than a four-speed transmission. Sooner or later, it will entirely supplant the three-speed transmission, just as the latter took the place of the two-speed transmission.

The four-speed transmission is used in practically all cars selling at \$4000 and over, but no other car selling at the White price—\$2000—is thus equipped. The White is built with a four-speed transmission, because it makes it a better car than if only a three-speed transmission were used. This is typical of the **QUALITY** of every detail of the White car—for example, a “honey comb” radiator is used instead of the cheaper and less efficient tubular radiator; the frame is of crucible chrome-nickel steel, instead of the usual carbon steel; the leather in the upholstery is hand-buffed, instead of the cheaper and almost universally used machine-buffed leather; forty-two days are devoted to painting the car, instead of one-third or one fourth of that time; etc., etc.

---

Write for a copy of our catalog, or, better yet, call on our nearest dealer, so that you may learn the many respects in which the construction of the White is better than ever before found in a car of moderate price.

---

**Licensed Under Selden Patent**

---

# THE WHITE COMPANY

**860 East 79th St., CLEVELAND, OHIO**

**NEW YORK CITY, Broadway at 62d Street**  
**BOSTON, 320 Newberry Street**  
**PHILADELPHIA, 629-633 N. Broad Street**  
**PITTSBURG, 138-148 Beatty Street**

**TORONTO, 170 King Street, West**  
**ATLANTA, 120-122 Marietta Street**  
**CHICAGO, 240 Michigan Avenue**  
**SAN FRANCISCO, Market Street at Van Ness Avenue**



# Columbia



The detailed refinements and  
luxury of Columbia motor  
cars distinguish them  
among other high-grade  
automobiles.

**COLUMBIA MOTOR CAR COMPANY**

**STATION 202, HARTFORD CONNECTICUT**

*Licensed under Selden Patent*

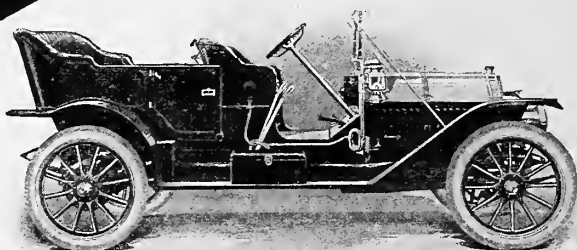
# Jackson

UNIT POWER  
PLANTS KEEP OIL IN  
AND DIRT OUT

Model "50"



**\$2350**



**MODEL "30"—\$1250.** Five-passenger touring car, detachable tonneau. Four-cylinder motor, 4-inch bore, 4-inch stroke, 105-inch wheel-base and 32-inch wheels.

**MODEL "40"—\$1700.** Five-passenger touring car or four-passenger tourabout, with detachable tonneau. Four-cylinder motor, 4½-inch bore, 4½-inch stroke, 110-inch wheel-base and 34-inch wheels.

**MODEL "50"—\$2350.** Touring car,—ample room for seven passengers. The two extra seats \$50.00 additional. Also furnished as a four-passenger tourabout with detachable tonneau. Four-cylinder motor, 4½-inch bore, 4½-inch stroke, 120-inch wheel-base and 36-inch wheels.

In all these cars the Jackson unit power plant is used; the valves are inclined at 45 degrees in the cylinder heads and operated by overhead cam-shaft. The clutches are multiple disc and they run in oil. All models have full elliptic springs, front and rear, and the frames are dropped to bring the cars close to the ground and still allow ample spring action.

## Jackson Automobile Co. Jackson, Michigan

Members A. L. A. M.

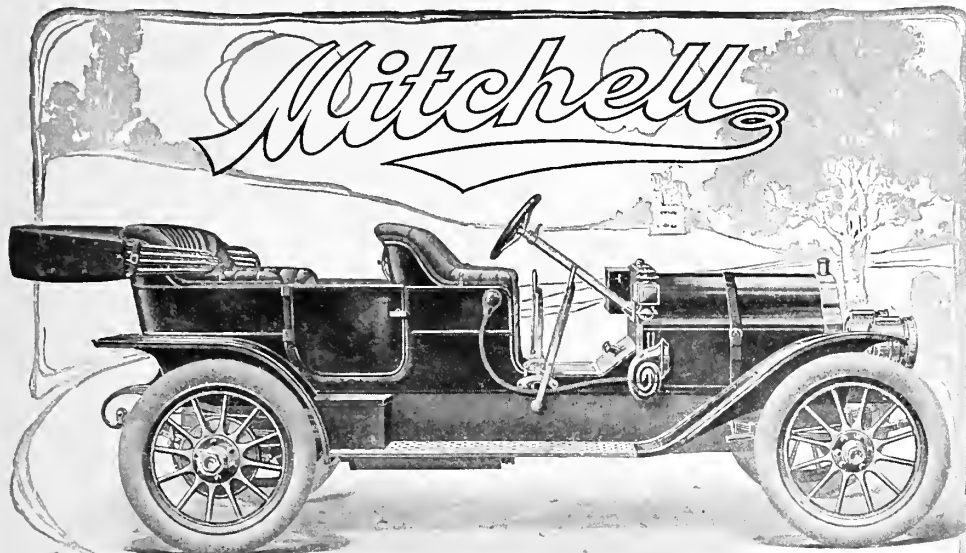
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### DISTRIBUTING AGENCIES

C. W. OATHOUT, 1663 Broadway, New York  
E. P. BLAKE, 821 Boylston St., Boston, Mass.  
JACKSON MOTOR CO., Kansas City, Mo.  
C. H. CHILDS & CO., Utica, N. Y.  
JACKSON MOTOR CO., Minneapolis, Minn.

C. D. PAXSON, Cleveland, O.  
RALPH TEMPLE AUTO CO., Chicago, Ill.  
JOHN DEERE PLOW CO., St. Louis, Mo.  
JOHN DEERE PLOW CO., Dallas, Texas.





### SILENT AS THE FOOT OF TIME

**T**HE whole world is fast coming to know that the Mitchell is the low-cost, high-class car. America, France, England, Germany, Russia, Spain—each contributes its share of praise for Mitchell beauty and construction—and patronage follows praise.

There is not a cheap feature about the Mitchell, except its price, and it has everything that makes an automobile admired and desired.

It is low-cost, because it is not priced on the hysterical basis, and because our facilities are so complete that we can keep down the cost of construction to where it belongs.

It is high-class because it is made of the same highest-class materials that the world's highest priced cars are made of, and quality is never sacrificed for quantity.

It is beautifully designed, finished and equipped. It is rakish, smart, refined, solid, comfortable and luxurious. It is silent in its running—absolutely silent—and it will last and serve you faithfully for years to come.

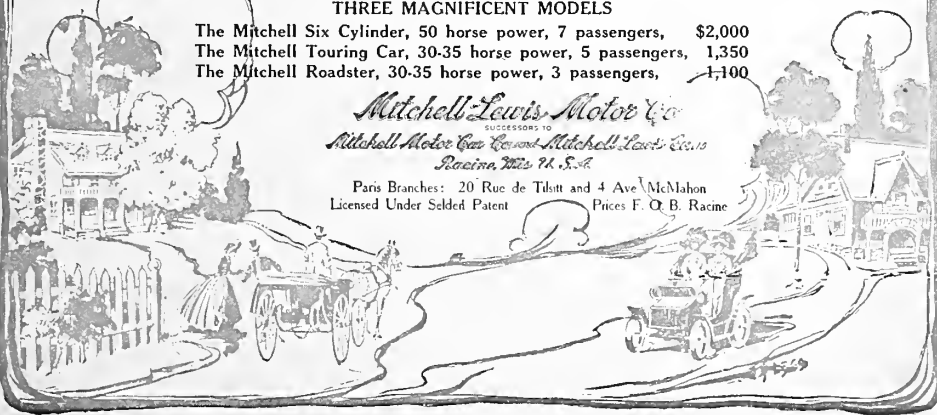
What more can there be to an automobile, and why should any car on earth sell for more money?

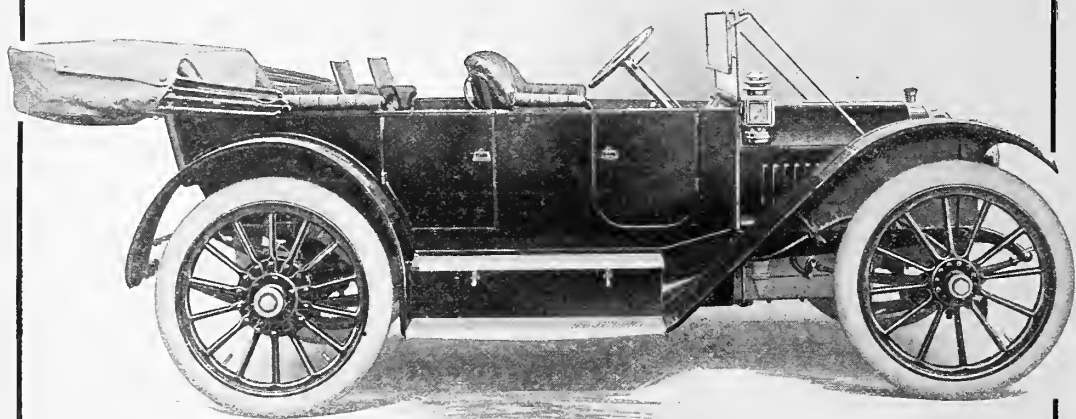
#### THREE MAGNIFICENT MODELS

The Mitchell Six Cylinder, 50 horse power, 7 passengers, \$2,000  
 The Mitchell Touring Car, 30-35 horse power, 5 passengers, 1,350  
 The Mitchell Roadster, 30-35 horse power, 3 passengers, 1,100

*Mitchell Lewis Motor Co.*  
 SUCCESSORS TO  
*Mitchell Motor Car Company Mitchell Car Co. Inc.*  
 Racine, Wis. U. S. A.

Paris Branches: 20 Rue de Tolst and 4 Ave. McMahon  
 Licensed Under Seldin Patent Prices F. O. B. Racine





# THE OWEN

## Designed for Touring Comfort

### **Forty Two-Inch Wheels and Large Tires**

solve the tire problem, reduce jolts and jars and with OWEN spring suspension give a new meaning to "easy-riding qualities."

### **Long Stroke Four Cylinder 50 H. P. Motor**

insures smoothness, quietness and power at slow speed.

### **High Front Doors**

add a classy style to the straight line body and protect the passengers.

### **Steering Gear Placed on the Left**

with gear shifting lever at operator's right in the center of the foot boards permits easy access to the front seats from right or left side and allows the driver to better gauge the road in passing other vehicles.

### **Full Touring Equipment**

leaves nothing to buy but fuel, and regularly includes—finest quality mohair top, and top slip cover, folding wind shield, speedometer, clock, electric horn, Prest-O-Lite tank, combination electric and gas head lamps, combination electric and oil side and tail lamps, tire carrier, muffler cut-out, foot accelerator, trunk rack, robe rail, gasoline gauge, tire chains, one extra inner tube and set of tools.

*Price, \$4000, F. O. B. Detroit*

Descriptive Literature on Request

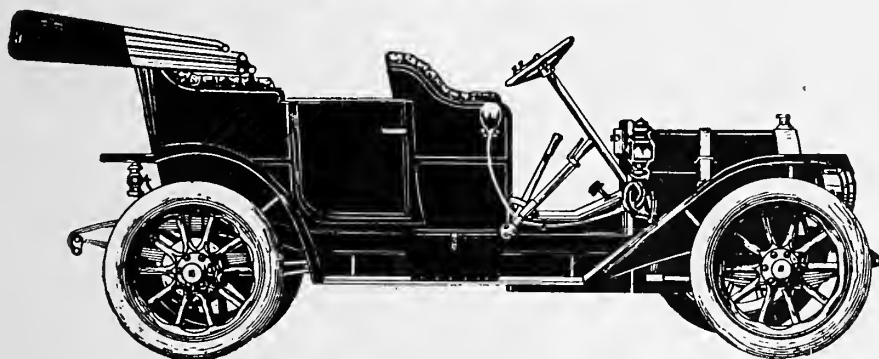
**Owen Motor Car Company**

1622 East Boulevard    ::    ::    ::    Detroit, Mich.

# ***The Bergdoll Car***

*is sold with a*  
***Perpetual Guarantee***

What better evidence can we give you of quality, of material and workmanship? Do you know of any other car giving you such a guarantee?



**1910 Bergdoll "30," \$1500**

with complete equipment of headlights, side lamps, rear lamp, Bosch magneto, etc.

This car is built by Louis J. Bergdoll, who was determined that the car bearing his name **must** be right from tire to top. Profit is a secondary consideration, for the **BERGDOLL CAR** is built to endure and therefore is a car of quality.

Agents who are seeking a moderate priced automobile which will add to their prestige and make for them a lasting and satisfactory business, will find the **BERGDOLL** the ideal proposition.

**We also manufacture Taxicabs  
and Town Cars**

Our plant and equipment is modern and complete, and deliveries will be made according to promise.

---

## **Louis J. Bergdoll Motor Co.**

31st and Dauphin Sts., Philadelphia

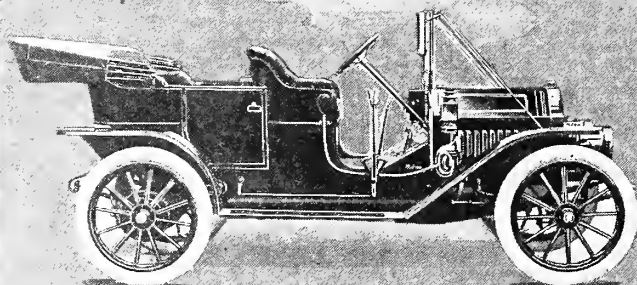
*Preeminently*

The Preference of  
Particular Buyers

The  
1910

**Moline** "30"

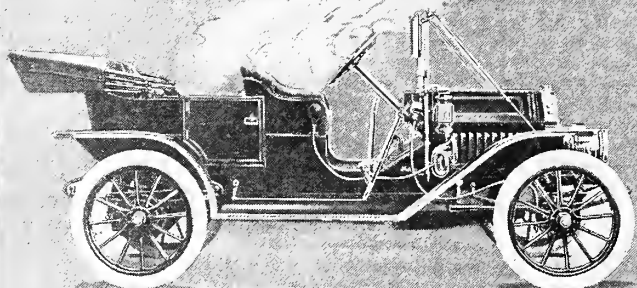
Especially Those  
Who Want



Passenger Touring Type, 4 Cyl. 30 h.p. \$1500

*Luxury*

*Service*



Roadster, 4 Cyl. 30 h.p. \$1500

*Economy*

At a Very  
Moderate Cost

Let us send you "Evidence from the Highest Court"  
Ask for Booklet No. 37

**Moline Automobile Co. E. Moline, Ill.**

LICENSED UNDER SELDEN PATENTS

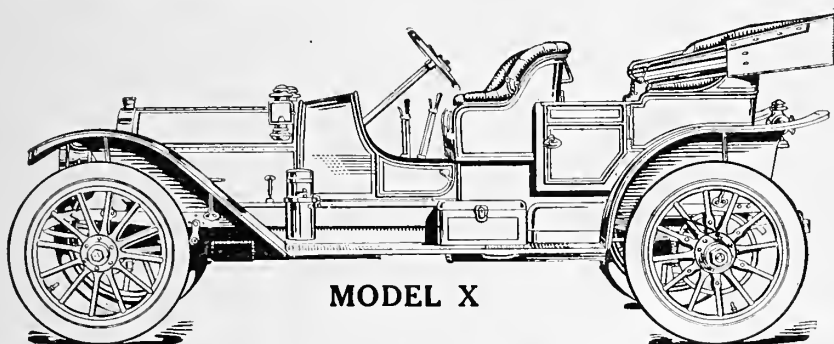


# STEVENS-DURYEA MOTOR CARS



*Strong Individuality has always  
been a Stevens-Duryea Characteristic*

The Model "X" with its correctness of mechanical design, harmony of body lines and high-grade workmanship shows the care and study that has been devoted to it.



MODEL X

A four cylinder, four passenger Light Touring Roadster of

**Distinction ∴ Refinement ∴ Economy**

Let us mail you our new CATALOG, or should you be interested mechanically, the INSTRUCTION BOOK of the MODEL "X" illustrates its Simplicity, its Substantial Construction and its Accessibility.

STEVENS-DURYEA COMPANY

Chicopee Falls, Mass.

Gentlemen:

Kindly mail me CATALOG \_\_\_\_\_ INSTRUCTION BOOK \_\_\_\_\_

Name \_\_\_\_\_

City \_\_\_\_\_

Street \_\_\_\_\_

State \_\_\_\_\_

Cut here

## Stevens - Duryea Company

Chicopee Falls, Massachusetts

Licensed Under Selden Patent



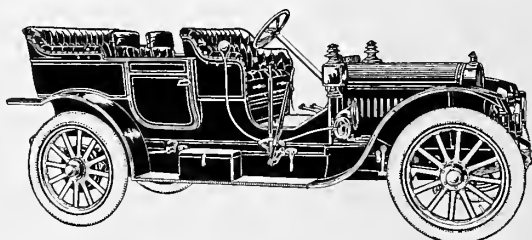
# Examine Any Four Cycle Engine and Then Inspect the



## Valveless Two Cycle

**Model 46—46 H. P.  
\$2500**

Also supplied  
as seven pas-  
senger Limou-  
sine.



**Model 36—36 H. P.  
4 cylinder, five-passen-  
ger Touring Car  
\$1750**

Also supplied as four-  
passenger Demi-Ton-  
neau, Landaulet and  
Doctor's Coupe.

**If the extraordinary vogue which the Elmore is enjoying is, in any sense, a source of surprise to you—it can only be because you are unconscious of the tremendous undercurrent which is drifting lay and expert opinion toward this valveless two cycle motor.**

When a motorist grasps the primary truth that high horse power is worthless unless it can be utilized at a low speed, he has become—consciously or unconsciously—a remorseless critic of the four cycle engine.

Several hundred thousand such critics are studying the automobile from that angle today, and the capacities of the Elmore plant are far, far behind the eager and insistent demand to take care of which the output will be trebled during the coming year.

These students are learning:—

That under ordinary circumstances, the maximum power of any engine is almost never needed or used—

That the time when you want power is when climbing a hill or (to avoid gear shifting) when traveling at moderate or slow speed on crowded thoroughfares or rough and dangerous roads.

And it is precisely under these conditions, which prevail the greater part of the time, that every four cycle engine is at its worst and every Elmore at its best.

When the Elmore engine is slowed down its torque, instead of rapidly decreasing, remains practically constant.

The charges exploded in the cylinders are strong and powerful; the power impulses are continuous; the torque is so constant that the power hangs on with bulldog-like tenacity.

At one thousand revolutions or more your four cycle is rampant with power delivered (although it has no advantage over the Elmore in that respect), but at low speed its infrequency of torque, and the resultant loss of rotative energy in the fly wheel, makes it fall so far below the Elmore in efficiency that there is simply no chance for comparison.

Your comfort, 90% of the time, is dependent upon that continuity of power impulse for which everyone is striving and which is found alone in the Elmore valveless two cycle.

You may endeavor to escape the inefficiency described—you will not escape it until you own an Elmore.

You may buy a car of excessive power; a lighter car of heavy power, or a six cylinder;—you will not get continuous torque and all that it implies.

If this subject impresses you as interesting, a revelation awaits you in your investigation of the Elmore; because we have been able herein to touch upon only one of a score of reasons why the Elmore valveless two cycle is uppermost in the minds of motorists today.

**The Elmore Manufacturing Co., 904 Amanda Street  
CLYDE, OHIO**

LICENSED UNDER SELDEN PATENT

# 2,365 Overlands

## On One Mid-Winter Day

On one day in February we received orders from dealers for the immediate delivery of 2,365 Overlands. The four Overland factories employ 4,000 men, yet this single day's orders meant three weeks' production. Thus the tide of demand—more markedly than ever—is turning to this matchless car.

We have already booked orders for many thousands of cars to be delivered in 1911. One dealer alone has ordered 3,500—the largest automobile order that ever was placed.

Thus they who know Overlands—who see what they are doing—are making sure of their future supplies.

### Note What This Means

Here is a car but little more than two years old. Yet our contracts from dealers for this season's delivery amount to \$24,000,000.

Our enormous capacity—one car each four minutes—is taxed to its utmost even now, at this writing, with deep snow on the ground.

All because thousands of owners have told thousands of others that no car compares with this.

Because no car is so simple, so trouble-proof, and none gives so much for the money.

Because of the wonderful engine—the pedal control—the fact that the car almost cares for itself.

The features which bring this flood-like de-

mand to the Overland will also win you when you know them.

**25 h. p. \$1,000—40 h. p. \$1,250**

The cost of the Overland, tremendous production, has been cut about 20 per cent.

This year we give a 25-horsepower Overland, with 102-inch wheel base, for \$1,000. And a 40-horsepower Overland, with 112-inch wheel base, for \$1,250, with single rumble seat. Prices include lamps and magneto.

Buyers would willingly pay a great deal more to secure the Overland features. But you get them all at a lower price than any equal grade cars can be sold.

### Get the Books

You should know the car which has become the king, in spite of a hundred rivals. You will find—like the rest—that it meets your ideals. We will send you two books—our beautiful catalog and "The Wonderful Overland Story"—if you simply send us your address. Cut out this coupon so you won't forget.

#### **The Willys-Overland Company**

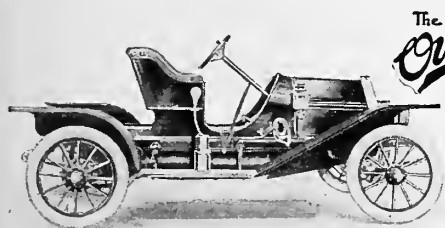
D 57

Toledo, Ohio

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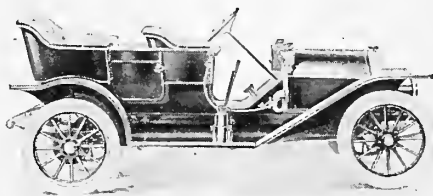
*Please send me the two books free.*

All prices include Magneto and full lamp equipment



The  
*Overland*

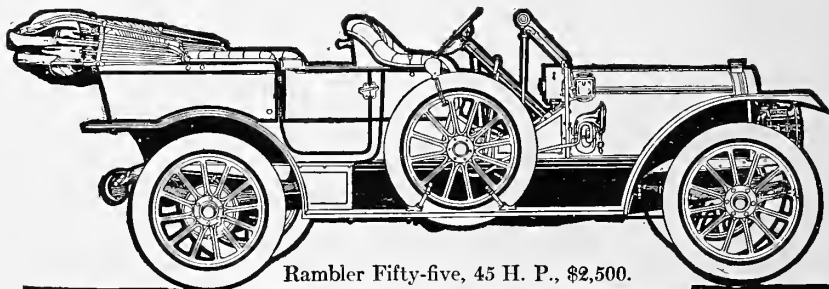
Two  
of  
the  
many  
Overland  
Models



Overland Model 38—Price \$1,000. 25 h.p.—102 inch wheel base. With single rumble seat, \$1,050—double rumble seat, \$1,075—complete Toy Tonneau, \$1,100

A 40 h.p. Overland with 112-inch wheel base. Price with single rumble seat, \$1,250—double rumble seat, \$1,275—with 5-passenger Touring or Close-Coupled body, \$1,400





Rambler Fifty-five, 45 H. P., \$2,500.  
With Magneto, Lamps, Presto-Lite Tank and Tools.

### The Straight-Line Drive

Power cannot be carried around a corner without great loss due to friction.

In the new Rambler the driving shaft, when the load is in the car, is in direct line with the crank-shaft, and the angle or corner found at one of the universal joints in most other driving systems is eliminated.

Thus it delivers the maximum power, saves energy, prevents wear and reduces cost of up-keep.

## THE NEW Rambler

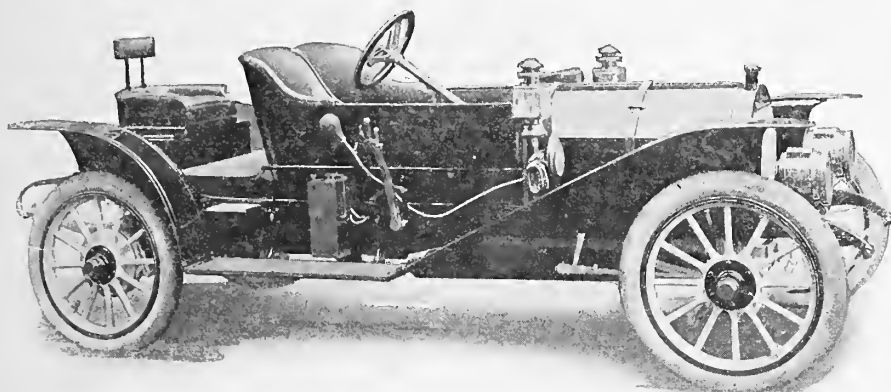
with this feature, combined with the offset crank-shaft, Rambler Spare Wheel, engine accessibility and new expanding clutch, possesses an efficiency quite in keeping with its quality and character.

May we send you a copy of the Rambler Magazine, a publication for Rambler owners?

THOMAS B. JEFFERY & COMPANY

KENOSHA, WISCONSIN.

# MERCER



**Three Models---each, \$1,950**

**Touring Cars, Baby Tonneaus, Speedsters**

**Prompt Deliveries**

**Dealers:—**

We will protect you so that you can protect your customers. We will deliver promptly and according to schedule and will allot enough cars for each territory to make it possible for you to do business profitably.

**T**HE Mercer Automobile Company, of which Mr. F. W. Roebling is President, is an organization of men whose names guarantee the success of the enterprise and superiority of the product. The car is made right, of the finest materials, is easy riding, silent and luxuriously finished. It is not a small car, as might be judged by the price, for it has a 116" wheel base and the motor develops 34 actual horse power.

Let us prove to you in your own way what our car will do. Remember we have the facilities to make prompt deliveries and will protect the dealer so that he, in turn, can give the buyer a square deal.

**MERCER AUTOMOBILE CO.**  
**TRENTON, N. J.**



Weighs 2200 lbs. Will do better than 60 miles per hour. Extremely low center of gravity. Radiator at rear of motor. Wheels, 36 inches; wheel base, 115½ inches. Turns in 30 feet—shorter than any American car built of its wheel base.

**30 H. P.—Price, \$2850.00**

**If the Best is None Too Good, You Will Choose**

## **The Croxton-Keeton Car**

If we have omitted one thing that would make these cars better, such omission has yet to be called to our attention. Smooth, silent, easy-running and speedy, they will reel off century after century without adjustments of any kind.

All we ask is investigation and comparison. The more you investigate, the closer you compare, the more convinced you will become that your choice of a car should be a "Croxton-Keeton."

## **The Croxton-Keeton Company**

**130 Walnut St., Massillon, Ohio**

New York, 1662 Broadway

Cleveland, 2174 E. 9th St.

Pittsburg, 5920 Baum St.

Boston, Motor Mart

Toledo, 233 Ontario St.

Chicago, 2035 Michigan St.

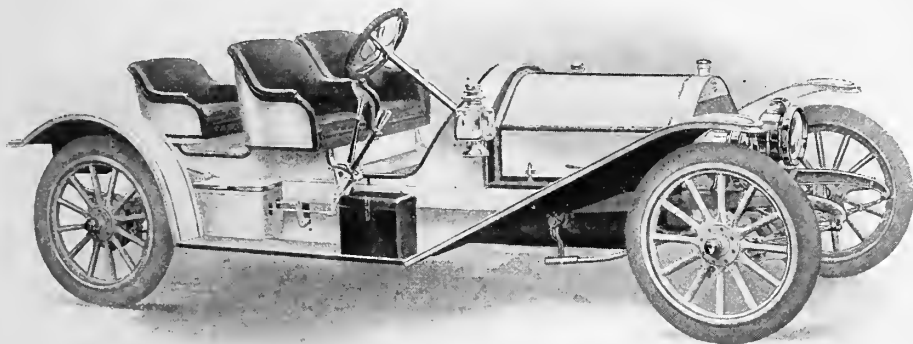
Providence, 420 Broad St.

Kansas City, 425 Delaware Ave.

This product is going to be the easiest selling proposition that any American manufacturer ever had to dispose of. This should be a broad enough intimation for you to get in touch with us at once.



# OTTO CAR



**Roadster Type B. Price, \$1950**

123-Inch Wheel Base    30-35 H. P.    Bosch Dual Ignition

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Built by the OTTO GAS ENGINE WORKS.  
Largest and oldest builders of Gas and Gasoline  
Engines in the world.

---

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**In Design, Material and Workmanship  
Is Unsurpassed at Any Price**

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WRITE FOR CATALOGUE A10 AND AGENTS' PROPOSITION

**OTTO MOTOR CAR SALES CO.**

33d AND WALNUT STREETS, PHILADELPHIA

# Inter-State

## This is the Type of Letters We Get from Our Dealers

A COMPLETE  
LINE AT  
LOWEST PRICES

SUPPLIES

REPAIRS

OF ALL KINDS  
FENDERS, LAMPS,  
BATTERIES, ENGINES,  
WHEELS, ETC., ETC.

INTER-STATE  
FRANKLIN  
STEVENS DURYEA  
BARCOCK ELECTRIC  
PALMER SINGER  
FLANDERS 20  
E. M. F. 30

### THE HOLCOMB COMPANY

105 GOFFE STREET

AUTOMOBILES

WE  
MANUFACTURE

NEW HAVEN }  
WIND SHIELDS }  
AUTOMOBILE ACCESSORIES  
HOLCOMB AUTO TOPS  
STORAGE BATTERIES  
CARRIAGE REPAIRING  
IN ALL ITS BRANCHES

NEW HAVEN, CONN., Feb 28, 1910.

Inter-State Automobile Co.,  
Muncie, Indiana.

Gentlemen:-

We have your letter under date of February 25th and are pleased to note that you have included in our contract Chester, Saybrook, Essex, Old Saybrook & Westbrook in Middlesex counties. We have attached this letter to our contract and as stated before we will work the territory and we feel we can give you good results from it. We might state that we have unloaded the carload of machines you shipped us, and to state that we are more than pleased with the finish and workmanship on them is to put it mildly. The writer has certainly not unloaded any cars at any time that have looked so good for the money as these Inter-States. We certainly will push these cars for all we are worth, and you can expect that we shall ask for more cars than our contract twice over. The completeness and the thoroughness with which you have finished the cars and the attention given to small details is marvelous. The writer has not seen any cars at any price that were more complete than these Inter-States. All that we hope is that these cars will prove as satisfactory as the Inter-State models we had last year, and we should like to hear from you in regard to the Hartford territory which we wrote you about in a letter of a few days ago. We are anxious to get this territory.

Yours very truly,

(Mr. Holcomb was obliged  
to leave before above letter  
was ready for signature.)

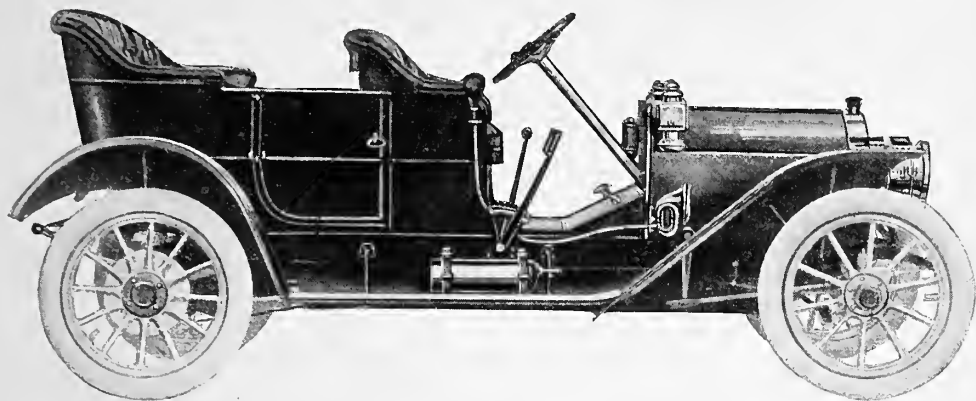
The Holcomb Company.

CT|F

INTER-STATE AUTOMOBILE CO. Muncie Ind.

# THE MARMON

"The Easiest Riding Car In The World"



## Trophies That Mean Something

Wheatley Hills  
(Vanderbilt)  
189.6 Miles  
190 Minutes  
without  
a Stop



**T**HESE are not by any means the only long mile-a-minute non-stop runs made by Marmon stock cars in great races. They stood this same terrific strain for 225 miles at Indianapolis, 100 miles on a circular track at New Orleans and for various distances in other contests with the best racing cars of the world.

**T**HEY have earned perfect scores year after year in the Glidden and other great endurance runs.

**T**HE reason for this amazing stability, this remarkably consistent reliability lies in the quality of the material and in the minute care with which every essential part of the car is manufactured—not merely assembled—by one of the oldest and most successful manufacturing institutions of America.

One Chassis, 32-40 H. P. **\$2,650**  
Complete Equipment

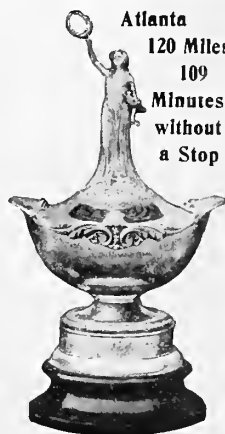
**NORDYKE & MARMON COMPANY**

(Established 1851)

Indianapolis, Indiana

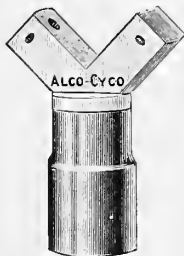
Licensed Under Selden Patent

Atlanta  
120 Miles  
109  
Minutes  
without  
a Stop

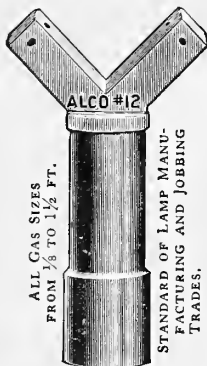


**ALCO DE LUXE**

The richest thing for Auto Lamps

**"CYCO"**

For motor cycle lamps. Pillar plain or corrugated.

**GERMAN LAVA ALCO No. 12.**

ALL GAS SIZES FROM 1/8 TO 1 1/2 FT.

STANDARD OF LAMP MANUFACTURING AND JOBBING TRADES.



WARRANTED GERMAN LAVA.

Made in all usual gas sizes.

# ALCO

(Trade Mark Reg. U. S. Pat. Office)

## Motor Boat Motor Cycle, Bicycle & Auto Lamp Acetylene Burners

None Better Known.

None Known to be Better.

You can install either of these beautiful burners with S wrench, bicycle wrench or pliers **without** barking your knuckles.

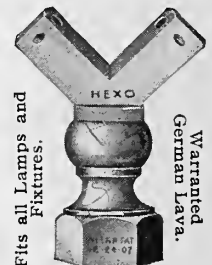
### WARNING!

Designs patented. Names trade marked.

**BICYCLE LAMP TIP**

Fits all lamps. Standard of the World.

"A little brother of the Rich"



Fits all Lamps and Fixtures.

Warranted German Lava.

**"HEXO"**

The correct thing - for motor cycle lamps. Fits all.

**ALCO NO 17**

German Lava For foreign Auto lamps.

**ALCO 100**  
(No Name) American Stone

We make many other shapes; all styles for which there is a demand. Samples free to the trade. Cuts supplied on request. See other adv., page 91.

## American Lava Co., Chattanooga, Tenn.



# Cheap and Unknown Acetylene Burners

(made only to sell)

vs.

# Standard, Advertised Alco Burners

(made to burn)

**It's like Toadstools and Mushrooms.**

**If you live they are mushrooms.**

**If you die, they were Toadstools!!**

¶ If, as Jobber or Dealer, you kill your burner business, and incidentally damage your reputation, it's because you gave encouragement to the distribution and use of Toadstool burners. It is commercial suicide to get stamped into handling the cheapest auto accessories, just because some competitor has also hurled himself headlong and thoughtlessly into the cheap game. If you stop to figure profits you will find the largest **immediate** as **well** as permanent profit is on Alco burners. The Alco line is the only comprehensive line, covering practically all shapes and styles, on which there is absolute Trade protection.

¶ Alco burners have the call. Two million and more will be sold in 1910. The user specifies them because he knows he is no expert acetylenist, but must depend on the judgment of the lamp makers, who have too much at stake to use any but the best gas burning devices known to the Art. Practically all lamp makers **use** and **pay more** for Alco burners, and yet there is no branch of the auto business in which competition is as keen, or need of manufacturing economy so great. There must be a reason, a weighty reason, why the lamp makers stick to Alco burners. Their's is a verdict you cannot safely ignore.

¶ But don't jump to the conclusion that Alco burners are the highest priced! As a matter of Fact they cost the Jobber and Dealer somewhat **less** than any other Genuine German Lava burners—and German stone is a requisite for acetylene burners of highest candle power, longest life and absolute reliability and uniformity. See our other full-page advertisement (page 90).

¶ Cuts supplied on request. Samples free to Jobbers and Dealers.

## American Lava Co., Chattanooga, Tenn.

To Cycle and Motor Cycle Jobbers—have you seen the Hexo?

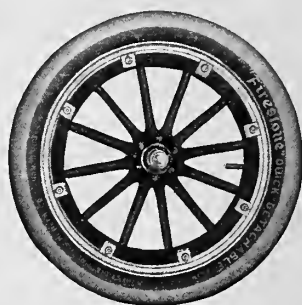
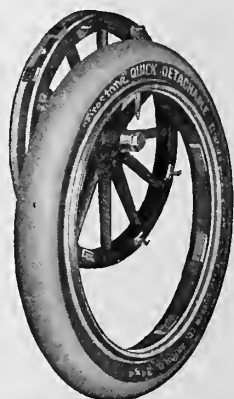
# ---Again Regarding "Firestone" Demountable Rims

¶ Note that 22 exhibitors had Firestone, against only 15 who had nearest competing make (the old-style clincher)—a big lead for the up-to-date Firestone.

¶ NOTE ONE of the many show-display-wheel imitations of the Firestone quick-detachable Demountable Rim was used by ANY manufacturer on his cars at ANY Show. Not one.

¶ As we said before, the Firestone is the ONLY perfected quick - detachable demountable rim; the ONLY one actually made in quantities, delivered and in general use to-day, the ONLY one good enough for YOUR car.

¶ Before putting your car into use for the season, you ought to equip with these time-and-trouble-saving Rims. Send now for Demountable Rim Book.



## Firestone Tire & Rubber Co.

Akron, Ohio

"America's largest exclusive tire makers"

Branches, agencies and dealers everywhere

# STILL ANOTHER CLEAN SWEEP

At the Boston, Chicago and two  
New York Auto Shows combined,  
for

## "Firestone" TIRES and DEMOUNTABLE RIMS

First in Non-Skid Tires: Firestone 167 tires, nearest competitor 142, next 127 and next 63, by actual count.

First in number of car exhibitors having demountable rim equipment: Firestone Demountable Rims shown by 22, nearest competing make shown by 15, next 9 and next 8, by actual count.

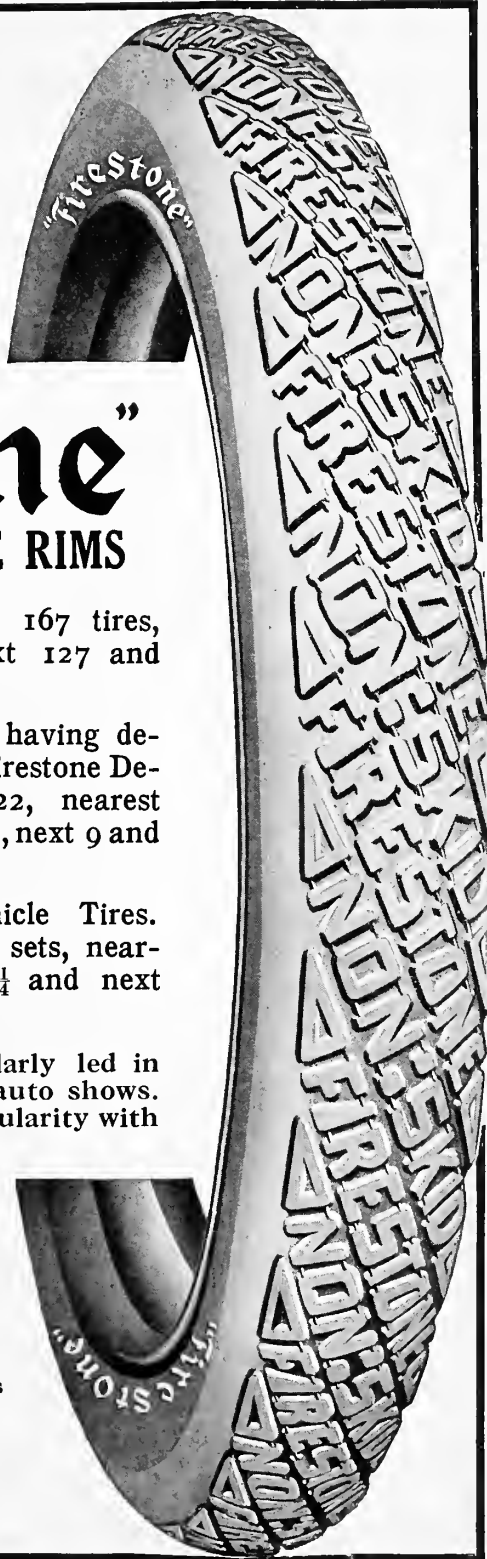
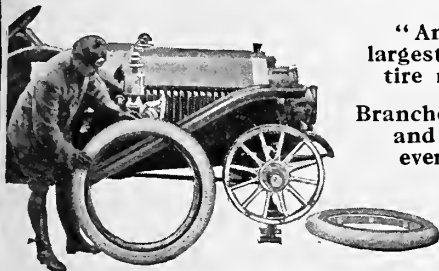
First in Commercial Motor Vehicle Tires. Firestone Side-Wire Tires 62 sets, nearest competitor 18½, next 18¼ and next 9½, by actual count.

No other equipment has so regularly led in popularity at the big representative auto shows. No other is gaining so steadily in popularity with the motoring public who KNOW.

**Firestone Tire & Rubber Co.**  
Akron, Ohio

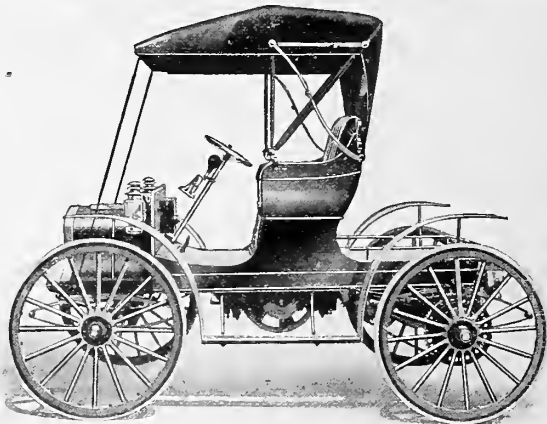
"America's  
largest exclusive  
tire makers"

Branches, agencies  
and dealers  
everywhere



## OUR SQUARE-DEAL CAR—This is the Car you are Looking For

**DURABLE**  
**ECONOMICAL**  
**ATTRACTIVE**  
**LASTING**



**\$375<sup>00</sup>**

**DESCRIPTION:** Fourteen horse power air-cooled motor, two cylinders, planetary transmission, two speeds forward and one reverse, Schebler carbureter, irreversible steering gear, ball bearing axles, 36" artillery wheels, Firestone side-wire solid rubber tires. Wheel base 82", track 56". High speed lever at side of body, low speed and reverse manipulated by foot pedal. Brake controlled by foot pedal. Price, \$350, equipped as shown in cut. We guarantee the construction of this machine to be of the best in every respect. We use the same chassis for a delivery wagon.

—GET OUR CATALOGUE OF SUPPLIES—

### Auto Parts Company

517-19-21-23 Jackson Boulevard,

:

:

Chicago, Ill.

## The Quickest Way to Bigger Profits

Is to become an "ENGER 40" dealer.

A comparison with higher-priced machines is all that will be necessary to convince you that with a license to sell the "Enger 40" this will be your banner year.

A comparison is all that is necessary to convince prospective customers that the "Enger 40" will give them the greatest value for the money spent.

The Fully  
Equipped

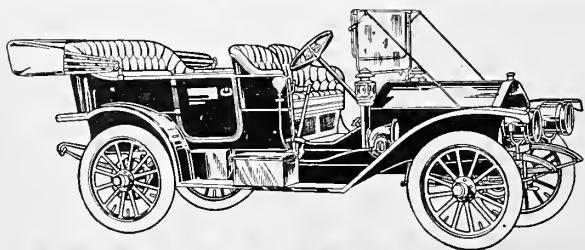
**ENGER "40"**

**\$2000**  
**Complete**

**"Just Get Oil and Gasoline—and Start"**

Is the highest type of automobile. Its low price is the result of perfect manufacturing methods, and does not begin to represent its value, as motor car prices go.

The "Enger 40" is actually fully equipped, all ready for use. Because of this, the purchaser knows the true price of his car at the outset, and the dealer has a *big advantage* over his competitor.



Our national advertising campaign is creating a strong demand over the entire country. Why not let it work for you?

We have a few choice territories still open. Send for catalog and full information.

**The Enger Motor Car Co.**

Summer and Gest Streets

CINCINNATI, OHIO

100 Per Cent.  
of Satisfied  
Customers

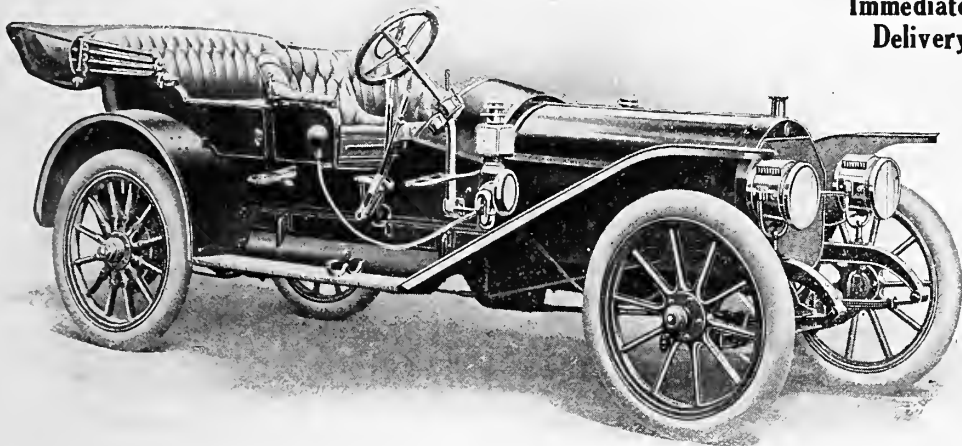
# "Matheson"

Licensed Un-  
der the Selden  
Patent

1910 Six-Cylinder 50 h. p., \$3,000

Equipped with choice of toy tonneau, touring, runabout, tourabout, or close-coupled bodies

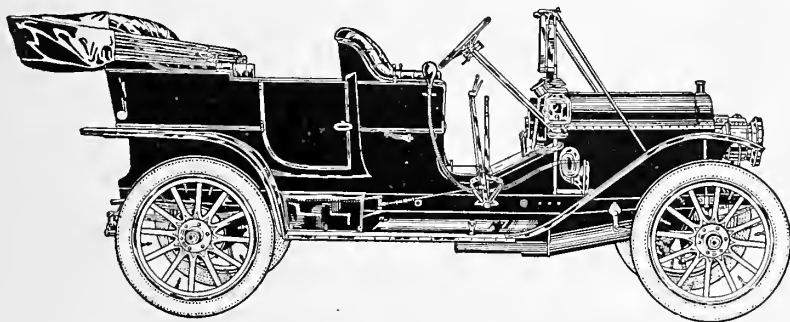
Immediate  
Delivery



The Matheson Six is the swiftest, the most economical in fuel consumption and tire wear, the most comfortable, the most thoroughly mechanical and the handsomest six-cylinder car on the market, regardless of price. This is our guarantee. You are the judge.

Also the 1910 Matheson Four, the very finest of all four-cylinder cars, immediate delivery of Touring Car, \$5,000, Toy Tonneau, \$4,750, and Limousine or Landaulet, \$5,750.

MATHESON AUTOMOBILE CO., Main Sales Office, 1886-1888 Broadway, N. Y. City



*Dorris*

TOURING CAR  
Price, \$2500

Equipt with

Top

Tire Carriers

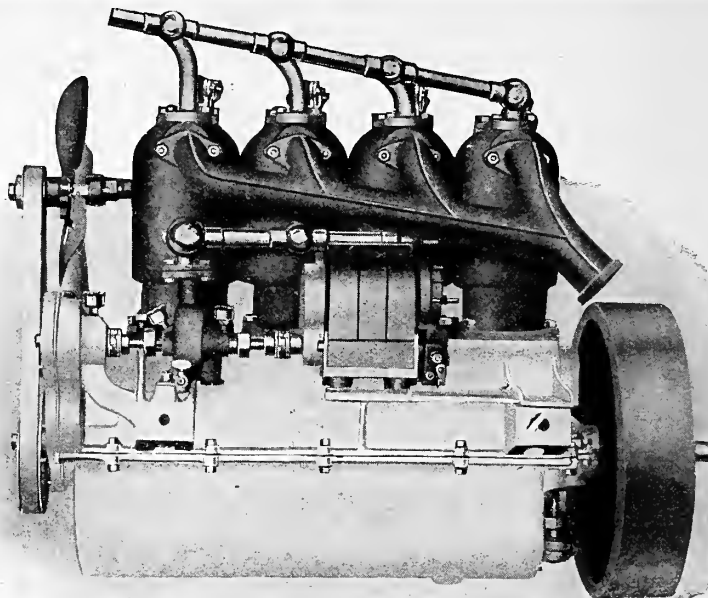
Prest-O-Lite Tank

Speedometer

Tools

Brass Folding Shield

Dorris Motor Car Company :: St. Louis, Mo.



The most powerful motor, with greater bearing surfaces than ever before produced for the weight. On these sizes, 20 to 55 horse-power, our output for 1911 will exceed ten thousand complete power plants.

**MODEL GAS ENGINE WORKS, PERU, INDIANA**

## High Grade Beaver Motors

**Work Like Beavers—Silent, Sure, Satisfactory**

6 Cylinder Vertical,  $4\frac{1}{2} \times 4\frac{1}{2}$

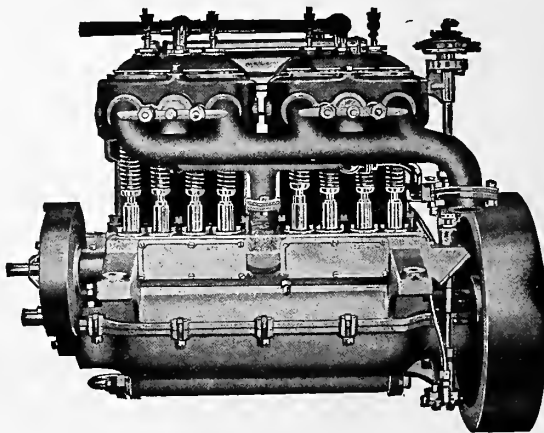
4 Cylinder Vertical,  $4\frac{1}{2} \times 4\frac{1}{2}$  and  $4\frac{1}{2} \times 5\frac{1}{2}$

2 Cylinder Horizontal Opposed,  $4\frac{1}{2} \times 4$  and  $4\frac{1}{2} \times 4$  &  $5\frac{1}{2} \times 4\frac{1}{2}$

4 Cylinder Horizontal Opposed,  $5\frac{1}{2} \times 4\frac{1}{2}$

Constant Level  
Splash  
Oiling  
System

All Motors are  
Four  
Cycle



The 4 Cylinder Horizontal Opposed Motor is Designed Specially for Commercial Trucks



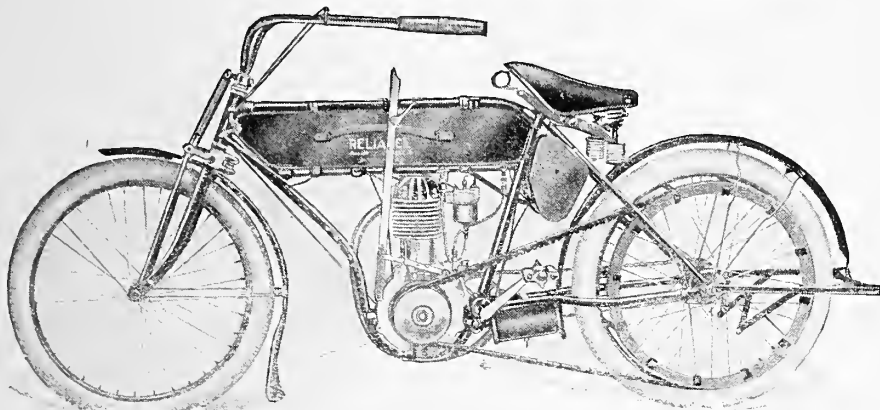
Write  
for  
**FREE**  
Booklet

**Beaver Mfg. Co., 783 Chase St., Milwaukee, Wis.**

(THE FILER-STOWELL CO., OWNERS)

# RELIANCE

Seventh Successful Season  
of the  
Reliable Reliance



**THE ONE NEW THING IN MOTOR-  
CYCLES AT THE CHICAGO SHOW**

**A COUPLE OF FEATURES:**

Truss SPRING Fork, the most flexible and enduring made.

Two-Speed and Free Engine Transmission Gear, the FIRST practical, compact arrangement made. Largest Clutch, Largest Gears and Largest Wearing Surfaces. One lever control.

*With this transmission the rider can start from standstill on the steepest hill. An absolute necessity for the construction of the perfect motorcycle. Full details in our catalogue, let us send you one.*

**RELIANCE MOTORCYCLE CO.**

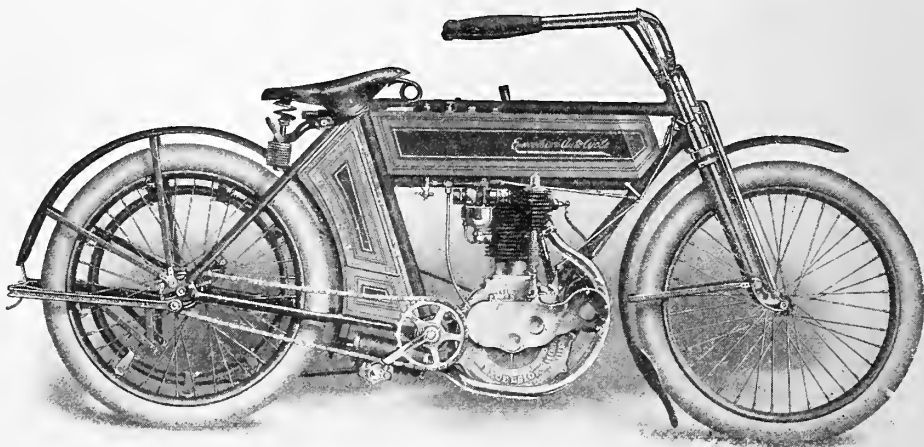
**OWEGO, N. Y.**

MEMBER MOTORCYCLE MANUFACTURERS' ASSOCIATION



# EXCELSIOR LAUTO-CYCLE.

Visible Superiority



¶ It is easy to claim high qualities hidden somewhere on the inside, but the discerning buyer wants to be "shown." The qualities of the

## EXCELSIOR AUTO-CYCLE

are not hidden or elusive. They show all over. ¶ Here are a few of them: Straight line frame, powerful, rational speed motor, low saddle position, mechanical sight feed oiler, positive internally lubricated hub brake, real shock absorbing spring fork and simple, positive grip control. ¶ These are some of the points that have established the EXCELSIOR REPUTATION—THE ONE THAT ALWAYS MAKES GOOD.

---

Catalog C10 gives full details. Why not send for it?

---

## EXCELSIOR SUPPLY COMPANY

233-237 Randolph St.

Members M. M. A.  
Established 1876

Chicago, Illinois

Eastern Representative: STANLEY T. KELLOGG, 2312 Broadway, New York  
PACIFIC COAST BRANCH—361-3 Golden Gate Ave., San Francisco, Cal.

## **You Can't Overlook the M. M.**

in making your selection this year. The M. M. is so positively good that it compels attention everywhere. At the Boston Show the M. M. Booth was the center of attraction. There are so many features about the 1910 models that appeal directly to you, the rider, that you can't afford not to "Compare the M. M."

That's what we ask riders to do—"Compare the M. M."—with any other machine no matter where it is made, and if you know motorcycles we'll guarantee you will find more value, more motorcycle, dollar for dollar, in the M. M. When you buy an M. M. you are getting value received—one hundred cents' worth of motorcycle for a dollar—every time.

Get the M. M. catalog—visit our nearest branch or agency—"Compare the M. M."—and then look at the prices. We're talking motorcycles first, mind you, quality motorcycles, and prices are secondary. But you'll find M. M. prices mighty satisfactory.

---

## **American Motor Company**

**715 Centre St. Brockton, Mass.**

**Member Motorcycle Mfrs. Assn.**

Distributing Stores: Boston, 273 Huntington Ave.; New York, Geo. P. Jenkins, 10 W. 60th St.; Buffalo, L. E. French, 895 Main St.; Chicago, G. M. Greene, Mgr. American Motor Co., 2127 Michigan Ave.; Dallas, American Motor Co. of Texas, M.M. Building; Los Angeles, Lincoln Holland, 1034 S. Main St.

# HESS-BRIGHT



# BEARINGS

## There Isn't a Doubt

as to the reliability of your bearings if they bear the HESS-BRIGHT TRADE-MARK—"H-B" or "D. W. F."

The fact that your bearings are stamped in this way is absolute assurance of reliability and wear, most careful workmanship, accuracy and the perfection of detail,—in fact, UNQUESTIONED SUPERIORITY.

We know what is needed to meet any requirements of load, etc. Tell us your requirements fully, and we will be pleased to estimate with you.

**The Hess-Bright Mfg. Co.,** 2102 Fairmount Ave.  
PHILADELPHIA, PA.

New York Branch Store - - - 1974 Broadway  
Chicago Branch Store - - 1800 Michigan Avenue

For Local Retail Sales Only



## A Little Plain Talk

If you were a manufacturer of an automobile and had to purchase from an outside source the magnetos for your "Regular Equipment"—and if you could buy certain ones with a well-known name that had a high "list price" for much less than some

other which had a lower list price to the consumer, but not so great a discount to you, and if the purchasers of your car were willing to accept any magneto you would offer them—which would you decide upon? You say the one of lowest cost to you. Of course you would! It's human nature.

Suppose the other magneto, the one which cost you a little more, BUT would permit of the engine being started on a quarter turn of the crank WITHOUT BATTERIES, develop more power, cut down gasoline consumption, allow throttling down the engine to from  $3\frac{1}{2}$  to 4 miles per hour on HIGH GEAR, entirely do away with the make-shift of DUAL IGNITION, and carried with it a written binding guarantee from the manufacturer of the magneto PROTECTING THE PURCHASER OF YOUR CAR AGAINST IGNITION TROUBLE, for all time, what would you do then?

You would give him this magneto, if HE INSISTED UPON IT, but if he did not, you would give him the other. His troubles, annoyances and upkeep expenses would not affect you, AFTER YOU HAD SOLD HIM THE CAR.

The automobile manufacturer was content, so far as HE was concerned, to furnish DRY CELLS for ignition until the purchaser forced him to equip his car with a magneto, and the most of THESE only half do the work they should do.

UNLESS THE PURCHASER DEMANDS the one magneto in the world which fulfills every claim made for it and carries with it a written guarantee protecting him for all time, as does the

## K-W High Tension Magneto

he will get "Regular Equipment" and nothing else. We want every prospective purchaser of a car or a magneto to test our claims and prove for himself whether or not he wants the freedom from all ignition troubles which K-W service and K-W protection afford.



40 POWER AVE.

CLEVELAND, OHIO. U.S.A.





**WH**  
*Shall We*

**Our Two 1910 Catalogues**

### *The One* **Bulletin Fourteen**

Treats of the K-W High Tension Magneto which is a Complete Ignition System in itself.

This magneto requires absolutely NO SPARK COIL, NO TIMER and NO BATTERIES of any kind, as the HIGH TENSION Current is generated in the magneto windings and carried direct to the spark plugs.

The K-W High Tension Magneto generates four waves per revolution of the magneto and the heaviest engine can be started on the quarter turn WITHOUT BATTERIES.

The K-W High Tension Magneto is designed for cars which have provision for magneto ignition and must be driven either by gear or sprocket and chain.

The K-W High Tension Magneto is the only magneto made which will allow starting the engine on a quarter turn without batteries and throttling down to from  $3\frac{1}{2}$  to 4 miles per hour on high gear.

The K-W High Tension Magneto carries with it a certificate of Insurance covering it

### *Forever*

against losing its power, unless battery current is run through it or the magnets are removed from the magneto, and the size and heat of the spark will never deteriorate. No other magneto carries such a guarantee, and furthermore, we agree to replace, FREE OF CHARGE, any parts proving defective in either material or workmanship within two years from date of purchase.

The K-W High Tension Magneto gives a hot spark on 17 R. P. M. Will positively shoot a poorer and thinner mixture than can be ignited by the most powerful battery system. Will develop more power than any battery system or other magneto.

K-W High Tension Magnets will not foul spark plugs or allow valves to stick or pit. All wearing parts are made of chrome steel, are accurately ground and lapped in place, thus insuring a maximum life.

### *The Other* **Bulletin Fifteen**

tells all about the K-W Low Tension Magnets which are used in connection with a vibrating spark coil and timer for Ignition — Electric Lights and Combined Ignition and Electric Lights.

The K-W Low Tension Magneto acts as a powerful and reliable source of current and entirely takes the place of dry cells and storage batteries.

The K-W Low Tension Magneto is designed for use on cars which have no provision for a magneto and is driven by either belt or friction from the fly-wheel.

The K-W Low Tension Magneto when used with a K-W Coil or K-W Master Vibrator and the old coil is absolutely guaranteed to start the heaviest engine on a quarter turn WITHOUT BATTERIES and run it perfectly AT ALL SPEEDS.

All "L-C" models are guaranteed in addition to furnishing perfect ignition to operate powerful searchlights, tail light and speedometer light, and is the



**ICH SEND YOU?**

**LOW TENSION CATALOGUE**

**ICH Send You?**

**Are Just Off the Press**

### *Only Magneto in the World*

which will do so. Guaranteed FOREVER against any loss of power (unless battery current is run through it or magnets are removed from the magneto), and any part proving defective will be replaced absolutely free within a period of two years from date of purchase.

Neither the K-W High Tension or Low Tension Magneto require any attention, with the exception of a few drops of oil

every few hundred miles and are OIL PROOF, WATER PROOF, DUST PROOF, and last but not least, Trouble Proof.

If this is the kind of a magneto YOU want, write us today for Bulletin 14.

***Sold on Thirty Days' Trial with  
Money Back Understanding***

## *When You Go to Buy a Car*

and the manufacturer tells you "Oh, yes, the car has a magneto on it—the very best, etc., etc.," just turn the switch on to the magneto, and give the crank a quarter turn and SEE IF YOU CAN START THE ENGINE. When you find you cannot start it—as you will find in every case, unless it is a K-W High Tension Magneto—refuse the "Regular Equipment" magneto, which only performs half what a real magneto is supposed to do, and specify a K-W.

It won't cost you any more, although it will the manufacturer, as we do not maintain a high list and give unfair discounts to confuse. You will then be able to start and increase the power and efficiency of your engine WITHOUT THE ASSISTANCE OF BATTERIES OF ANY KIND.

We are responsible to you in case of any trouble or dissatisfaction.

Think these facts over. Let them sink into your very soul, and you will have no cause to upbraid yourself for the one thing which every man hates, "being stung."

### **WHICH SHALL WE SEND YOU?**

Bulletin 14

**K-W High Tension Magneto**

OR

Bulletin 15

**K-W Low Tension Magneto**

**Ask about the K-W Spark Coil—GUARANTEED FOREVER**







### The One Bulletin Fourteen

Treats of the K-W High Tension Magneto which is a Complete Ignition System in itself.

This magneto requires absolutely NO SPARK COIL, NO TIMER and NO BATTERIES of any kind, as the HIGH TENSION Current is generated in the magneto windings and carried direct to the spark plugs.

The K-W High Tension Magneto generates four waves per revolution of the magneto and the heaviest engine can be started on the quarter turn WITHOUT BATTERIES.

The K-W High Tension Magneto is designed for cars which have provision for magneto ignition and must be driven either by gear or sprocket and chain.

The K-W High Tension Magneto is the only magneto made which will allow starting the engine on a quarter turn without batteries and throttling down to from  $3\frac{1}{2}$  to 4 miles per hour on high gear.

The K-W High Tension Magneto carries with it a certificate of Insurance covering it

### Forever

against losing its power, unless battery current is run through it or the magnets are removed from the magneto, and the size and heat of the spark will never deteriorate. No other magneto carries such a guarantee, and furthermore, we agree to replace, FREE OF CHARGE, any parts proving defective in either material or workmanship within two years from date of purchase.

The K-W High Tension Magneto gives a hot spark on 17 R. P. M. Will positively shoot a poorer and thinner mixture than can be ignited by the most powerful battery system. Will develop more power than any battery system or other magneto.

K-W High Tension Magnetos will not foul spark plugs or allow valves to stick or pit. All wearing parts are made of chrome steel, are accurately ground and lapped in place, thus insuring a maximum life.

### The Other Bulletin Fifteen

tells all about the K-W Low Tension Magnetos which are used in connection with a vibrating spark coil and timer for Ignition—Electric Lights and Combined Ignition and Electric Lights.

The K-W Low Tension Magneto acts as a powerful and reliable source of current and entirely takes the place of dry cells and storage batteries.

The K-W Low Tension Magneto is designed for use on cars which have no provision for a magneto and is driven by either belt or friction from the fly-wheel.

The K-W Low Tension Magneto when used with a K-W Coil or K-W Master Vibrator and the old coil is absolutely guaranteed to start the heaviest engine on a quarter turn WITHOUT BATTERIES and run it perfectly AT ALL SPEEDS.

All "L-C" models are guaranteed in addition to furnishing perfect ignition to operate powerful searchlights, tail light and speedometer light, and is the



### Only Magneto in the World

which will do so. Guaranteed FOREVER against any loss of power (unless battery current is run through it or magnets are removed from the magneto), and any part proving defective will be replaced absolutely free within a period of two years from date of purchase.

Neither the K-W High Tension or Low Tension Magneto require any attention, with the exception of a few drops of oil

every few hundred miles and are OIL PROOF, WATER PROOF, DUST PROOF, and last but not least, Trouble Proof.

If this is the kind of a magneto YOU want, write us today for Bulletin 14.

*Sold on Thirty Days' Trial with  
Money Back Understanding*

### When You Go to Buy a Car

and the manufacturer tells you "Oh, yes, the car has a magneto on it—the very best, etc., etc." just turn the switch on to the magneto, and give the crank a quarter turn and SEE IF YOU CAN START THE ENGINE. When you find you cannot start it—as you will find in every case, unless it is a K-W High Tension Magneto—refuse the "Regular Equipment" magneto, which only performs half what a real magneto is supposed to do, and specify a K-W.

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### WHICH SHALL WE SEND YOU?

Bulletin 14  
K-W High Tension Magneto

OR

Bulletin 15  
K-W Low Tension Magneto

Ask about the K-W Spark Coil—GUARANTEED FOREVER



## Guaranteed Service

### Protection for a Lifetime

Do you use a spark coil on your car? Have you ever had any trouble with it? Do you have to pet it and coax it to make it work with even a weak battery current?

Very few people look beyond the polished case of a spark coil as to its worth—thinking that they are all alike—but when it breaks down, short circuits or burns out, they wake up.

The K-W Spark Coil is the only coil made by the special Vacuum Impregnating Process, is absolutely dry and moisture proof, won't short circuit or break down. We guarantee the K-W Spark Coil *FOREVER* and will replace free of charge any coil that ever goes back on you.

Read the copy of our guarantee given below, and then write us about it. You can have it on a 30 days' trial free, with money back upon request.



THINK IT OVER



40 POWER AVE.

CLEVELAND, OHIO. U.S.A.

IF IT'S

**Thermoid**  
Brake Lining

**Thermoid**  
Tires

**Thermoid**  
Inner Tubes  
OR

**Thermoid**  
Mattings, Bumpers,  
Tubing, etc.

IT'S RIGHT

Or the **Thermoid** Rubber Co.  
TRENTON, N. J. Wouldn't Sell It TRENTON, N. J.

An Automobile  
is no better than  
its brake and the  
brake is not the  
best, if it is not

**AUTOBESTINE**

equipped with **Autobestine Brake Lining**.

This is the one part of the car which must not contain an element of doubt, for the brake must work one time more than ninety-nine in a hundred to make the car safe to operate. **Autobestine** is a combination of purely mineral and absolutely fire-proof substances and is indestructible under any degree of heat. Put it to the severest tests,—twist it, bend it, try to tear it, endeavor to burn it. The more severe the test, the greater your realization that **Autobestine** is a brake-lining of extraordinary merit. 'Nothing can injure it. It can stand any sort of abuse,—water, air, heat or cold.

A properly made brake fitted with **Autobestine Brake Lining** will never fail you. It will respond instantly to the slightest touch and will out-wear the best car built.

To those manufacturers who wish to make tests of **Autobestine**, we will send samples without cost.

For prices and full particulars write to the sole manufacturers.

## **Woven Steel Hose & Rubber Co.** **TRENTON, N. J.**

### **DISTRIBUTERS:**

**T. F. RUSSEL & CO.**  
176 Federal St., Boston, Mass.

**JAMES L. GIBNEY & BRO.**  
212 and 214 N. Broad St., Phila., Pa.

**EXCELSIOR SUPPLY CO.**  
233 to 237 Randolph St., Chicago, Ill.  
**CONSUMER'S RUBBER CO.**, 829 Superior Ave., N. W., Cleveland, Ohio

**We want to be represented in every locality by responsible distributing houses. File your application early.**

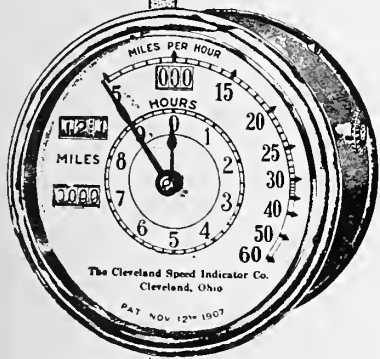
# The CLEVELAND SPEED AND TIME INDICATOR

**SHOWS: Miles Per Hour, Season Hours, Season Miles, Trip Miles, Trip Hours.**

Based upon the simple escapement principle the "CLEVELAND" Speed and Time Indicator gives more information with greater accuracy and with less moving parts than was ever put together in the form of a speedometer.

But the "CLEVELAND" is more than a speed indicator. It tells the time in transit.

It gives all the information that could possibly be desired. The "CLEVELAND" simply cannot wear out.



## NEAT NOVEL NEEDED

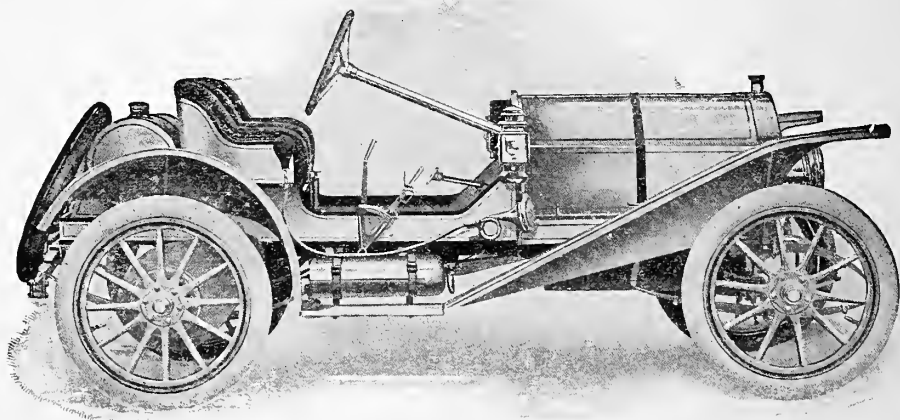
Let us tell you how simple the "CLEVELAND" is in construction and operation. Let us tell you the advantage of knowing how many minutes your chauffeur has used your car, or how many minutes it has taken your truck to do its trip. We have new things of interest to the users of speedometers. Let us tell you about them.

**The Cleveland Speed Indicator Company**

1806 EUCLID AVENUE, CLEVELAND, O.



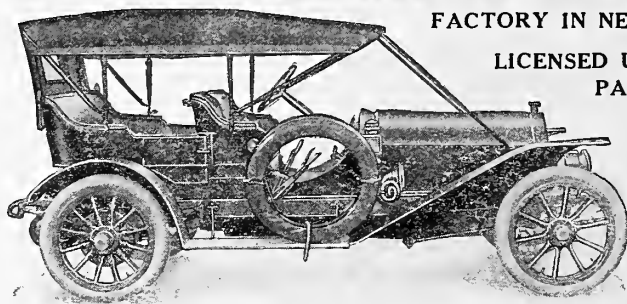
# EMPIRE TWENTY



MODEL B, \$850.00

A Roadster of distinctive mechanical features, attractive appearance and low initial and maintenance cost. Arrange with nearest dealer for demonstration. Catalogue on request.

EMPIRE MOTOR CAR CO. :: INDIANAPOLIS, INDIANA



FACTORY IN NEW YORK CITY  
LICENSED UNDER SELDEN  
PATENT

GUARANTEED  
FOR ONE  
YEAR

Six-Sixty—Six cylinder, 60 H. P. Sixty-five miles an hour, \$3,500

We wish you could compare the actual *performance* in your own hands of the Palmer-Singer Six-Sixty, for instance, and ALL other cars at the same or higher prices. As that is, of course, impossible, why don't you compare their mechanical features side by side? Remember, on these depend performance.

**Palmer & Singer Manufacturing Company**

1620-22-24 Broadway, New York

1321 Michigan Ave., Chicago

## Section I

# Automobiles, Pleasure & Commercial, Motor Cycles, Motor Boats, Flying Machines & Aeronautical Supplies

## GASOLINE PLEASURE VEHICLES

- A.B.C. Motor Vehicle Mfg. Co., 3915 Morgan St., St. Louis, Mo. "A.B.C."
- Abbott Motor Co., The, 176 Beaufait Ave., Detroit, Mich. "Abbott-Detroit."
- Abendroth & Root Mfg. Co., 320 Fifth Ave., N. Y. City. "Frontenac."
- Acme Motor Car Co., The, 8th & Elm Sts., Reading, Pa. "Acme."
- Adams Co., The, Dubuque, Iowa. "Adams-Farwell."
- Albaugh-Dover Co., Marshall Blvd. & 21st St., Chicago, Ill. "Aldo."
- Allen-Kingston Motor Car Co., 3 West 44th St., N. Y. City. "Allen-Kingston."
- American Locomotive Co. (Auto Dept.), 1886 Broadway, N. Y. City. "Alco."
- American Motor Car Co., Indianapolis, Ind. "American."
- Anchor Motor Car Co., South & Summer Sts., Cincinnati, O. "Anchor."
- Anderson Carriage Mfg. Co., Anderson, Ind. "Anderson."
- Angus Automobile Co., Angus, Neb. "Fuller."
- Anhut Motor Car Co., The, Detroit, Mich. "Anhut."
- Apperson Bros. Auto Co., Kokomo, Ind. "Apperson."
- Atlanta Motor Car Co., Atlanta, Ga. "White Star."
- Atlas Motor Car Co., 88 Birnie Ave., Springfield, Mass. "Atlas."
- Auburn Automobile Co., Auburn, Ind. "Auburn."
- Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich. "Austin."
- Auto-Bug Co., The, Norwalk, Ohio.
- ★Autocar Co., The, Ardmore, Pa. "Autocar."
- ★B. C. K. Motor Car Co., York, Pa. "Kline Kar."
- ★Babcock, H. H. Co., Watertown, N. Y. "Babcock."
- Badger Motor Car Co., Columbus, Wis. "Badger."
- ★Bartholomew Co., The, 210 Glide St., Peoria, Ill. "Glide."
- Belden Motor Car Co., Bessemer Bldg., Pittsburgh, Pa. "Belden."
- Belmont Automobile Mfg. Co., State & Lawrence Sts., New Haven, Conn. "Belmont."
- Benz Auto Import Co. of America, 1599-1601 Broadway, N. Y. City. "Benz" (imported).
- ★Bergdoll, Louis J. Motor Co., 31st & Dauphin Sts., Phila., Pa. "Bergdoll."
- Berkshire Motor Car Co., Renne Ave., Pittsfield, Mass. "Berkshire."
- Bertolet Motor Car Co., The, 13 S. 5th St., Reading, Pa. "Bertolet 40." (Convertible to order.)
- Beyster-Detroit Co., 1329-31 Woodward Ave., Detroit, Mich.
- ★Black Mfg. Co., 215-219 E. Ohio St., Chicago, Ill. "Black." (Sales agents for "Black Crow" cars, Crow Motor Car Co., factory.)
- Bonner, C. E. Mfg. Co., Chrisman, Ill. "Bonner."
- Bowman, Sidney B. Automobile Co., 225-231 W. 49th St., N. Y. City. "Clement-Bayard." (Importers.)
- Boyd Steel Spring Co., 305-13 State St., Brooklyn, N. Y.
- British Napier Motors, 47 Union Ave., Jamaica Plain, Boston, Mass. "British Napier." (Imported.)
- Brown Motor Car Co., Washington, Ind.
- ★Brush Runabout Co., 14 Baltimore Ave., W., Detroit, Mich. "Brush."
- Buckeye Mfg. Co., Anderson, Ind. "Lambert."
- Buggycar Co., The, John St. & Armory Ave., Cincinnati, Ohio. "Buggycar."
- Buick Motor Co., Flint, Mich. "Buick."
- Burdick Motor Car Co., Eau Claire, Wis. "Burdick Greyhound."
- Burg, The L. Carriage Co., Dallas City, Ill. "The Burg."
- Burns Bros., Havre De Grace, Md.
- C. & G. Auto Co., 312 W. 43rd St., N. Y. City.
- C. G. V. Import Co., 49 W. 64th St., N. Y. City. "C. G. V." (Imported.)
- Cadillac Motor Car Co., 1343 Cass Ave., Detroit, Mich. "Cadillac."
- Cameron Car Co., The, Beverly, Mass. "Cameron."
- ★Carhartt Automobile Corporation, 902 Union Trust Bldg., Detroit, Mich. "Carhartt."
- Cartercar Co., Pontiac, Mich. "Cartercar."
- ★Chadwick Engineering Works, Pottstown, Pa. "Great Chadwick Six."
- Chalfant Motor Car Co., Lenover, Pa. "Chalfant."
- Chalmers Motor Co., Jefferson Ave. & New Belt Line, Detroit, Mich. "Chalmers."
- ★Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y. "Chase."
- Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill. "Duer."
- Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."
- Clark & Co., Lansing, Mich. "Clark."
- Clarke Carter Automobile Co., Jackson, Mich. "Cutting."
- Clark-Hatfield Auto Co., Oshkosh, Wis. "Clark-Hatfield."
- Clark Motor Car Co., Shelbyville, Ind. "Clark."
- Coates-Goshen Automobile Co., Goshen, N. Y. "Coates-Goshen."
- Colburn Automobile Co., 15th St. and West Colfax Ave., Denver, Col. "Colburn."
- Cole Motor Car Co., Indianapolis, Ind. "Cole."
- Columbia Electric Co., Knightstown, Ind. "Leader."
- ★Columbia Motor Car Co., Hartford, Conn. "Columbia."
- Columbus Buggy Co., The, Columbus, Ohio. "Firestone-Columbus."

★ indicates Advertisers—see Index in back of book.

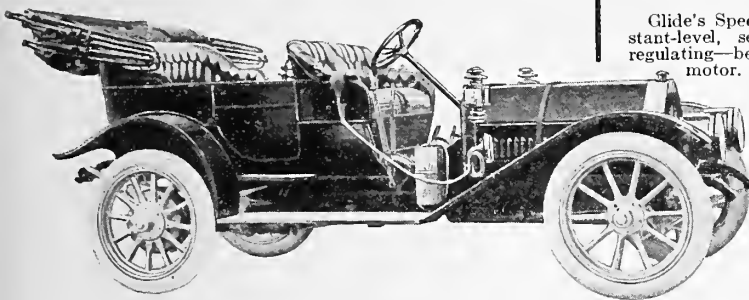


**GASOLINE PLEASURE VEHICLES — Continued**

- Conti, Cesare, 35-37 Broadway, N. Y. City. "S. P. A." (Imported.)
- ★Corbin Motor Vehicle Corporation, The, New Britain, Conn. "Corbin."
- Courier Car Co., The, Wayne Ave., Dayton, Ohio.
- Crane Motor Car Co., 94-104 W. 7th St., Bayonne, N. J.
- ★Crawford Automobile Co., Hagerstown, Md. "Crawford."
- Crow Motor Car Co., The, Elkhart, Ind. "Black-Crow." (Black Mfg. Co., Sales Agents.)
- ★Croxtton-Keeton Motor Co., Massillon, Ohio. "Croxtton."
- Cunningham, James, Son & Co., Rochester, N. Y.
- Darby Motor Car Co., 530 De Baliviere Ave., St. Louis, Mo. "Darby."
- Davis, Geo. W. Carriage Co., Richmond, Ind.
- Dayton Motor Car Co., Dayton, Ohio. "Standard-Dayton."
- Dayton, W. O. Motor Car Co., 11th Floor, Tacoma Bldg., Chicago, Ill.
- Deal, J. J. & Co., Jonesville, Mich.
- De Dion Bouton Selling Branch, 1649 Broadway, N. Y. City. "De Dion-Bouton."
- Delahaye Import Co., 2 Rector St., N. Y. City. "Delahaye." (Imported.)
- Demotcar Co., 1305 Bellevue Ave., Detroit, Mich. "Demot."
- De Schaum Motor Syndicate Co., 316 Prudential Bldg., Buffalo, N. Y. "De Schaum Buffaloes."
- De Shaw Motor Co., 50-54 Summerfield St., Evergreen, L. I., N. Y. "De Shaw."
- De Tamble Motors Co., Anderson, Ind. "De Tamble."
- Detroit-Dearborn Motor Car Co., Detroit, Mich.
- Diamond Automobile Co., The, South Bend, Ind. "R. A. C." & "Diamond."
- Diamond T Motor Car Co., 3 E. Huron St., Chicago, Ill. "Diamond T."
- ★Dorris Motor Car Co., 22 to 38 S. Sarah St., St. Louis, Mo. "Dorris."
- Duplex Motor Car Co., 11400 Michigan Ave., Roseland, Chicago, Ill. "Duplex."
- Durocar Mfg. Co., The, 927-935 Los Angeles St., Los Angeles, Cal. "Durocar."
- ★Duryea, Chas. E., Reading, Pa. "Duryea Buggyaut."
- Easton Machine Co., S. Easton, Mass. "Morse."
- Economy Motor Car Co., Joliet, Ill.
- Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind. "Pratt-Elkhart."
- Elkhart Motor Car Co., Elkhart, Ind. "Sterling."
- ★Elmore Mfg. Co., 1004 Amanda St., Clyde, Ohio. "Ehmore."
- Embree-McLean Carriage Co., 1813-23 Olive St., St. Louis, Mo. "Embree-McLean."
- ★Empire Motor Car Co., Indianapolis, Ind. "Empire."
- ★Enger Motor Car Co., The, Gest St. & C. H. & D. R. R. Crossing, Cincinnati, Ohio. "Enger."
- Etnyre Motor Car Co., Oregon, Ill. "Etnyre."
- Eureka Motor Car Mfg. Co., 3025-29 Olive St., St. Louis, Mo. "Eureka."
- Evansville Automobile Co., Evansville, Ind. "Simplicity."
- Everitt-Metzger-Flanders Co., Detroit, Mich. "E-M-F" & "Flanders."
- Fadeley-Hill Company, The, 1336 New York Ave., Washington, D. C.
- ★Fal Motor Co., 171 N. May St., Chicago, Ill. "Fal-Car."
- Falcon Engineering Co., 3145 N. Halsted St., Chicago, Ill. "Falcon."
- Fetzger Automobile Mfg. Co., Columbus & Walnut Sts., Galion, Ohio. "Fetzger."
- Fiat Automobile Co., 1786 Broadway, N. Y. City. "Fiat." (Imported.)
- Field Automobile Mfg. Co., 241-45 N. Ninth St., Lincoln, Neb. "Field."
- Flandrau Motor Car Co., 406-12 Broome St., N. Y. City. "Brasier." (Imported.)
- Flint Wagon Works, Flint, Mich. "Whiting."
- Ford Motor Co., 254 Piquette Ave., Detroit, Mich. "Ford."
- Fort Pitt Motor Mfg. Co., Pittsburg, Pa. "Pittsburg Six."
- Four Traction Auto Co., The, Mankato, Minn. "Kato 4-Drive."
- Franklin, H. H. Mfg. Co., Auto Dept., 402 South Geddes St., Syracuse, N. Y. "Franklin."
- French Motor Import Co., 1777 Broadway, Room 216, N. Y. City. "Barre" & "Grenoire." (Imported.)
- Fuller Buggy Co., Jackson, Mich. "Fuller."
- G. J. G. Motor Car Co., White Plains, N. Y. "Pirate" & "Scout."
- Gabriel Auto Co., Cleveland, Ohio. "Gabriel."
- Gaeth Automobile Co., The, 2553 W. 25th St., Cleveland, Ohio. "Gaeth."
- Garrett Machine Works Co., Garrett, Ind.
- Graves & Congdon Co., Carriage Ave., Amesbury, Mass. "Crown."
- Great Western Automobile Co., Peru, Ind. "Great Western."
- Grout Automobile Co., Orange, Mass. "Grout."
- Haberer & Co., Gest, Evans, Berlin & Summer Sts., Cincinnati, O. "CinO."
- Haynes Automobile Co., The, Kokomo, Ind. "Haynes."
- Henry Motor Car Co., Muskegon, Mich.
- Herreshoff Motor Co., Harper & Dequindre Sts., Detroit, Mich. "Herreshoff."
- Hobbie Automobile Co., Hampton, Iowa. "Hobbie."
- Holland Automobile Co., Holland, Mich.
- Holmes, Chas. Maching Co., Cambridgeport, Mass. "Holmes."
- Holsman Auto Co., 444 Monadnock Bldg., Chicago, Ill. "Holsman."
- Hol-Tan Co., 1741 Broadway, N. Y. City. "Lancia." (Imported.)
- Hotchkiss Import Co., 20 W. 60th St., N. Y. City. "Hotchkiss." (Imported.)
- Haupt, Harry S., 2004 Broadway, New York City. "Haupt" & "Herreshoff."
- Howard Motor Car Co., The, Galion, Ohio.
- Hudson Motor Car Co., Detroit, Mich. "Hudson."
- ★Hupp Motor Car Co., Cor. Jefferson & Concord Aves., Detroit, Mich. "Hupmobile."
- Imperial Automobile Co., Jackson, Mich. "Imperial."
- Indiana Motor & Mfg. Co., Indianapolis, Ind.
- Industrial Automobile Co., The, Elkhart, Ind. "Federal."
- International Harvester Company of America, 7 Monroe St., Chicago, Ill. "International Auto Buggy."
- ★Inter-State Automobile Co., Muncie, Ind. "Inter-State."
- J. & M. Motor Car Co., Lawrenceburg, Ind. "The James."
- ★Jackson Automobile Co., Jackson, Mich. "Jackson."
- ★Jeffery, Thos. B. & Co., Kenosha, Wis. "Ramblor."
- Jenkins Motor Car Co., 1135-49 University Ave., Rochester, N. Y.
- Jewel Carriage Co., Carthage, O. "Breeze."
- Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis. "Empress," "Elite" & "Special."
- Jonz Automobile Co., Beatrice, Neb. "Jonz."
- K-R-I-T Motor Car Co., Detroit, Mich.
- Kansas City Vehicle Co., 2d & Main Sts., Kansas City, Mo. "Gleason."
- Kearns Motor Car Co., Beavertown, Pa. "Kearns."
- Kenmore Mfg. Co., 324 Gaff Bldg., Chicago, Ill. "Kenmore."
- ★Kissel Motor Car Co., The, Hartford, Wis. "Kissel Kar."
- Klink Motor Car Co., Dansville, N. Y. "Klink."

# This is the Car

—the Glide— that stands comparison, point for point, with every standard car on the market under the most expert investigation—and is victor in the comparison, not “price considered,” but irrespective of its lower price.



## Glide Special 45

Seven-Passenger, 45-horsepower Touring Car;  
Wheel Base, 120 inches; 36 x 4½ tires, \$2500.

**The Bartholomew Company, Peoria, Ill.**

(Licensed Under Selden Patent)

### Send for Printed Proofs of These 7 Glide Car Points

Glide Motor—same type used in highest-priced four-cylinder cars.

I

Glide Cylinders—cast separately, giving maximum cooling surface.

II

5-bearing crankshaft.

III

Glide's Special Oiling System, constant-level, self-contained and self-regulating—best ever invented for a motor.

IV

No clutch on any car compares with Glide Multiple Disc Clutch.

V

Glide's one universal joint located where the universal joint belongs. One oiling lasts a year.

VI

Glide Brakes—extra big and efficient, with equalizing bars—insuring equal pressure on all wheels.

VII

“Show me” these points. Also that Glide Bearings, Magneto, Ignition, Wheels, Tires, Springs and Upholstery stand all comparisons.

Name .....

Town .....

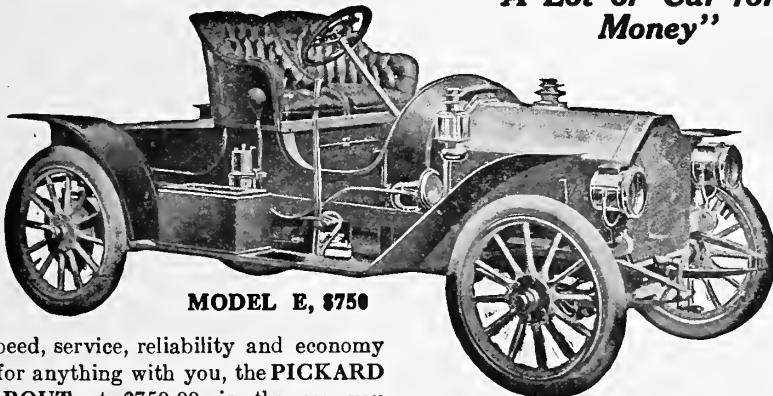
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THE BARTHOLOMEW CO., 210 GLIDE STREET,  
PEORIA, ILL.

# Pickard

## \$750

**“A Lot of Car for the Money”**



**MODEL E, \$750**

¶ If speed, service, reliability and economy count for anything with you, the **PICKARD RUNABOUT** at \$750.00 is the car you want, for there is nothing on the market that approaches it, at the price.

¶ We have other models as follows: Model F, Rumble Seat, \$800. Touring Car, Model H, \$850. Surrey, Model G, \$825. Model A, \$1400. Model B, \$1400. Model C, \$1450. Model D, \$1500.

Get full particulars  
of our line

**PICKARD BROS., BROCKTON, MASS.**

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- Knox Automobile Co., Wilbraham Road, Springfield, Mass. "Knox."  
 Koeb-Thompson Motors Co., The, Leipsic, O.  
 ★Koehler, The H. J. Co., 1709 Broadway, N. Y. City. "Koehler 40."  
 Lanpher Motor Buggy Co., Carthage, Mo. "Lanpher."  
 Larsen Ice Machine Co., 1832 Arlington Place, Chicago, Ill. "Falcon."  
 Lauth-Juergens Motor Car Co., 528 Elston Ave., Chicago, Ill.  
 Leist Automobile Mfg. Co., Michigan City, Ind. "Leist."  
 Lende Automobile Mfg. Co., 617 Guaranty Bldg., Minneapolis, Minn. "Lende."  
 ★Lexington Motor Car Co., Inc., The, Lexington, Ky. "Lexington."  
 Lincoln Motor Vehicle Co., Lincoln, Ill. "Lincoln."  
 Lion Motor Car Co., Adrian, Mich. "Lion."  
 Locomobile Co. of America, Bridgeport, Conn. "Locomobile."  
 Lozier Motor Co., Broadway, Cor. 56th St., N. Y. City. "Lozier."  
 Lumund Motor Car Co., Rutherford, N. J.  
 Luverne Automobile Co., Luverne, Minn. "Luverne."  
 ★McCue Co., The, Hartford, Conn. "McCue Hartford."  
 ★McFarlan Motor Car Co., Connerville, Ind. "McFarlan Six."  
 ★McIntyre, W. H. Co., Auburn, Ind. "McIntyre."  
 McNabb Iron Works, Atlanta, Ga. "Billy Four."  
 Manlius Motor Co., Manilus, N. Y. "MMC."  
 Marion Automobile & Mfg. Co., Indianapolis, Ind. "Marion."  
 ★Matheson Automobile Co., 1886-1888 Broadway, N. Y. City. "Matheson."  
 Maxwell-Briscoe Motor Co., Tarrytown, N. Y. "Maxwell."

- Maytag-Mason Motor Co., Waterloo, Ia. "Maytag" & "Maytag."  
 ★Mercer Automobile Co., Trenton, N. J. "Mercer."  
 Metz Co., The, Waltham, Mass. "Metz Plan."  
 ★Metzger Motor Car Co., Detroit, Mich. "Everitt."  
 Michigan Buggy Co., Kalamazoo, Mich.  
 Michigan Motor Car Mfg. Co., Ltd., 730 Penobscot Bldg., Detroit, Mich. "Michigan Six."  
 Middleby Automobile Co., N. River St., Reading, Pa. "Middleby."  
 ★Midland Motor Co., Moline, Ill. "Midland."  
 Mier Carriage & Buggy Co., Ligonier, Ind. "Mier."  
 Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis. "Majestic."  
 ★Mitchell-Lewis Motor Co., Racine, Wis. "Mitchell."  
 ★Moline Automobile Co., East Moline, Ill. "Moline."  
 ★Monitor Automobile Works, 315 Dearborn St., Chicago, Ill. "Monitor."  
 Monsen, A., 329 N. Clark St., Chicago, Ill. "Monsen."  
 Moon Motor Car Co., Main & Cornelia Sts., St. Louis, Mo. "Moon."  
 ★Mora Company, 17 Mora Place, Newark, N. Y. "Mora."  
 Morse-Readio Auto Co., Mill & S. Main Sts., Springfield, Mass.  
 Motor Buggy Mfg. Co., 399 S. Third St., Minneapolis, Minn. "Acme."  
 Motor Car Repair Co., The, 509-515 W. 56th St., N. Y. City. "Prodal."  
 Moyer, H. A., Syracuse, N. Y.  
 Munch Motor Car Co., The, Du Bois, Pa. "Keystone Six."  
 Nash Auto Co., Detroit, Mich.

# KLINE KAR

## The Car of Service and Satisfaction

### DEALERS:—

If you are interested in obtaining a clean-cut, up-to-date, snappy, reliable line of cars,—a complete line, a dependable line, always pleasant and profitable to sell,—get the **KLINE-KAR AGENCY**.

### Prompt Deliveries Guaranteed

6 cylinder, 40-45 H. P. Touring Car, Toy Tonneau, Roadster or speed car, equipped with Bosch magneto, full floating rear axle, selective sliding gear transmission, 122 inch wheel base. . . . .

**\$2500**

4 cylinder, 24-30 H. P. Touring Car, Toy Tonneau or Roadster of the same exclusive design and built of high-grade material and workmanship. . . . .

**\$1575**

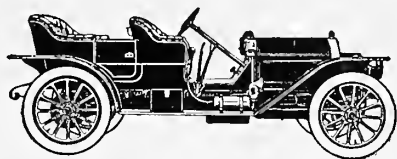
Write for full particulars

**B. C. K. MOTOR CAR CO. - - York, Pa.**

**GASOLINE PLEASURE VEHICLES — Continued**

- ★National Motor Vehicle Co., 1003 E. 22d St., Indianapolis, Ind. "National."
- Neville, T., Oshkosh, Wis. "Neville."
- ★Nurdyke & Marmon Co., Morris St. & Kentucky Ave., Auto Dept., Indianapolis, Ind. "Marmon."
- Oakland Motor Car Co., Pontiac, Mich. "Oakland."
- Ohio Motor Car Co., The, Cincinnati, O. "Ohio."
- Olds Motor Works, Lansing, Mich. "Oldsmobile."
- Omar Motor Company, 25 Seigrist St., Newark, N. Y. "Browniekar." (Juvenile.)
- Only Car Co., The, Port Jefferson, N. Y. "Only Car."
- Oriental-Detroit Co., The, Birmingham, Mich.
- Otto, Albert T., Motor Mart, 1876 Broadway, N. Y. City. "Bertolet." (Imported.)
- ★Otto Gas Engine Works, The, 33rd & Walnut Sts., Phila., Pa. "Otto."
- Overholt Co., The, Galesburg, Ill. "Illinois."
- ★Owen Motor Car Co., Detroit, Mich.
- Packard Motor Car Co., Boulevard & Belt Line, Detroit, Mich. "Packard."
- Paige-Detroit Motor Car Co., 224-258 21st St., Detroit, Mich. "Paige-Detroit."
- ★Palmer & Singer Mfg. Co., 1618-1620 Broadway, N. Y. City. "Palmer-Singer."
- Panhard & Levassor, Broadway & 62nd St., N. Y. City. "Panhard & Levassor." (Imported.)
- Panther Car Co., 100 Boylston St., Boston, Mass. "Panther."
- Parry Auto Co., Indianapolis, Ind. "Parry."
- Paterston, W. A. Motor Car Co., S. W. cor. 3rd & Harrison Sts., Flint, Mich. "Paterston."
- ★Peerless Motor Car Co., The, Quincy Ave. & E. 93rd St., Cleveland, O. "Peerless."
- Pell Motor Car Co., Oswego, N. Y.
- Pennsylvania Auto-Motor Co., Bryn Mawr, Pa. "Pennsylvania."
- Petrel Motor Car Co., Milwaukee, Wis.
- ★Pickard Bros., 8-14 Foundry St., Brockton, Mass. "Pickard."
- Piedmont Buggy Co., Monroe, N. C.
- Pierce-Arrow Motor Car Co., The, 1695 Elmwood Ave., Buffalo, N. Y. "Pierce-Arrow."
- Pierce Motor Co., The, Racine, Wis. "Pierce-Racine."
- Piggins Bros., Racine, Wis. "Piggins."
- Pilot Motor Car Co., The, N. 10th St., Richmond, Ind.
- Pioneer Car Co., The, El Reno, Okla.
- Plymouth Motor Truck Co., The, Plymouth, O. "Plymouth."
- Pope Mfg. Co., The, Hartford, Conn. "Pope-Hartford."
- Powercar Auto Co., The, York, Central Ave. & Linneaus St., Cincinnati, O. "Powercar."
- Power Vehicle Co., Suite 8, Cawker Bldg., Milwaukee, Wis.
- ★Premier Motor Mfg. Co., Georgia & Shelby Sts., Indianapolis, Ind. "Premier."
- ★Pullman Motor Car Co., York, Pa. "Pullman."
- Pungs-Finch Auto & Gas Engine Co., 1524 Jefferson Ave., Detroit, Mich. "Pungs-Finch."
- Queen City Motor Car Co., Cincinnati, O.
- Quinby, J. M. & Co., 21-39 Division St., Newark, N. J. "Isotta." (Imported.)
- Rainier Motor Co., 1920 Broadway, N. Y. City. "Rainier."
- Ranger Automobile Co., 1224-44 E. 46th St., Chicago, Ill. "Ranger."
- ★Regal Motor Car Co., Beaubien & Trombley Aves., Detroit, Mich. "Regal."
- Renault Freres Selling Branch, 1776 Broadway, N. Y. City. "Renault." (Imported.)
- Reo Motor Car Co., Lansing, Mich. "Reo."

★ indicates Advertisers—see Index in back of book.

*National***\$2,500****"40"****Costly Construction**

**EVERYBODY** "in the know" of the Automobile recognizes this as the big bargain of the year. Not a little car with a big rating, but a big car with a low rating. Think of it! A big car with cylinders 5x5 $\frac{11}{16}$ , with 36" wheels, with a wheel-base of 124 inches, with Bosch magneto and storage battery, with the finest materials and workmanship in the world throughout at **\$2,500!** A car that beats a mile a minute on circular tracks—a car that is big, powerful, luxurious and capable in the highest degree for such a price! It's the best value of the year.

**PARTIAL SPECIFICATIONS**

**Motor**—Four cylinder, 5x5 11-16 inches vertical, cast in pairs. Water-cooled; centrifugal pump. **Clutch**—Self-contained aluminum, cone leather faced, spring cushioned. **Transmission**—Sliding gear, selective type. Three speeds forward and reverse. **Wheel base**—124 inches. **Drive**—Bevel gear, through propeller shaft. **Oiling**—Crank case, constant level force feed oiler, oiling all working parts of motor. **Ignition**—Two separate complete systems. One a gear-driven, high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs. **Tires**—36x4. **Gasoline Capacity**—20 gallons. **Brakes**—Two systems. Two internal expanding metal to metal hub brakes and two hand brakes on outside of rear wheel drums. **Front Axle**—I-beam steel forging. **Rear Axle**—Compound construction: inner axle used only as a driver. **Body**—Straight line. Carrying capacity, five passengers. **Springs**—Half elliptic, 40-inch front under frame, 48-inch rear,  $\frac{1}{2}$  scroll elliptic. **PRICE, \$2,500.**

**NATIONAL SIXES**

"Fifty"—Six Cylinders, 4 $\frac{1}{2}$ x4 $\frac{3}{4}$  . . . \$4,200  
 "Sixty"—Six Cylinders, 5x5 . . . \$5,000

Type of Body—Touring, Baby Tonneau or Roadster—optional on all National Cars.

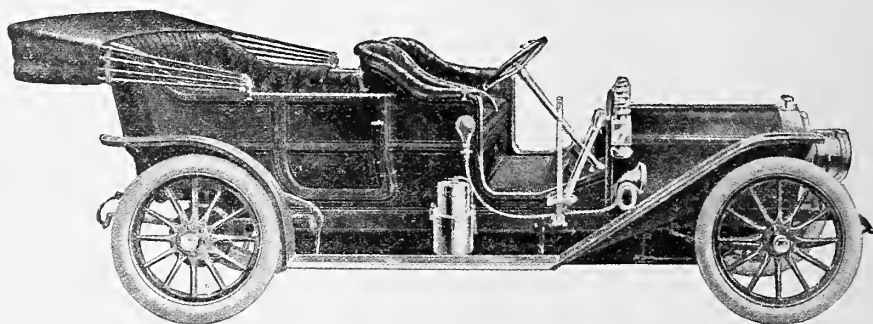
**National Motor Vehicle Co.**  
 1003 East 22nd St., Indianapolis, Ind.

**GASOLINE PLEASURE VEHICLES — Continued**

- Republic Motor Car Co., The, Hamilton, Ohio. "Republic."
- Rider-Lewis Motor Car Co., The, Anderson, Ind. "Rider-Lewis."
- Robson Mfg. Co., Galesburg, Ill. "Gale."
- Rowerdink, W. H. & Son, Rochester, N. Y.
- Royal Tourist Car Co., Gordon Park Blvd., & L. S. & M. S. Ry., Cleveland, Ohio. "Royal Tourist."
- ★St. Louis Car Co., 5201 N. 2nd St., St. Louis, Mo. "Standard."
- Salter, The W. A. Motor Co., 1516-20 Oakland Ave., Kansas City, Mo. "Salter."
- Schacht Mfg. Co., 2727 Spring Grove Ave., Cincinnati, O. "Invincible Schacht."
- ★Schlosser Mfg. Co., 151 E. 126th St., N. Y. City.
- Schurmeier Motor Car Co., The, 29 Western Ave., Minneapolis, Minn.
- Sears Roebuck & Co., Homan & Harvard Aves., Chicago, Ill. "Sears."
- Sebring Motor Car Co., The, Sebring, O. "Sebring Six."
- ★Selden Motor Vehicle Co., Rochester, N. Y. "Selden."
- ★Sharp Arrow Automobile Co., 942 S. Clinton Ave., Trenton, N. J. "Sharp Arrow."
- Silent Sioux Auto Mfg. Co., Sioux Falls, S. D.
- Simplex Automobile Co., Inc., 614 E. 83rd St., N. Y. City. "Simplex."
- Simplex Motor Car Co., Mishawaka, Ind. "American Simplex."
- Sinclair-Scott Co., The, Wells & Patapsco Sts., Baltimore, Md. "Maryland."
- Smith Auto Co., 10th & Jefferson Sts., Topeka, Kan. "Great Smith."
- Southern Motor Works, 341-349 N. Royal St., Jackson, Tenn. "Marathon."
- Spaulding Mfg. Co., Grinnell, Iowa. "Spaulding."

- Speedwell Motor Car Co., Dayton, O. "Speedwell."
- Spoerer's, Carl Sons Co., 901-09 S. Carey St., Baltimore, Md.
- Springfield Motor Car Co., The, Springfield, Ill. "Springfield."
- Stafford Motor Car Co., Kansas City, Mo. "Stafford."
- Standard G. E. Power Co., cor. 50th & Lancaster Ave., Phila., Pa. "Keystone" & "Standard."
- Star Motor Car Co., 605-08 Law Bldg., Indianapolis, Ind.
- Starr Motor Car Co., 522-25 S. 10th St., Minneapolis, Minn. "Starr."
- Staver Carriage Co., 76th & Wallace Sts., Auburn Park, Ill. "Staver-Chicago."
- Stearns, F. B. Co., The, Euclid Ave. & Lakeview, Cleveland, O. "Stearns."
- ★Stevens-Duryea Co., 700 Main St., Chicopee Falls, Mass. "Stevens-Duryea."
- Streator Motor Car Co., The, Streator, Ill. "Halladay."
- Studebaker Automobile Co., South Bend, Ind. "Studebaker," "Studebaker Flanders" & "Studebaker E-M-F."
- Stuyvesant Motor Car Co., 216 Columbia Bldg., Painesville, Ohio.
- Sultan Motor Co., 1659 Broadway, New York City. "Sultan."
- Swift Automobile Co., Detroit, Mich.
- Thomas, The E. R. Motor Co., 1200 Niagara St., Buffalo, N. Y. "Thomas Flyers."
- Thomas, Owen Motor Car Co., Janesville, Wis.
- Traveller Automobile Co., Evansville, Ind. "Traveller."
- United States Carriage Co., Columbus, Ohio. "Great Eagle."
- United States Motor Co., 505 5th Ave., N. Y. City. (Controlling the Maxwell-Briscoe Mfg. Co. & the Columbia Motor Car Co.)

## Marathon



Unit power plant—three-point suspension, 30 H. P., 4-cylinder motor, water cooled; selective transmission, three speeds; multiple disc clutch; Remy magneto; wheel base 112"; tires 34" x 3½" Q. D.; 5 lamps, generator, horn, tool kit, jack, etc.

**Price, \$1500.00**

**Prompt Deliveries**

**Southern Motor Works**  
**Jackson, Tenn.**

The Biggest  
Cars for  
Their Prices

# 1910 Black-Crow 1910

Six Splendid  
Cars in the  
Black Crow  
Line

**DEALERS:**—Wire or write for special proposition to handle sales and prospects on guaranteed delivery dates in your territory on the full Black Crow Line.

Model "C" Roadster, 25-30 H. P., 3-passenger - - \$1,000.00  
Model "D" Roadster, 25-30 H. P., 4-passenger - - 1,050.00  
Model "E" Surrey, 25-30 H. P., 4-passenger - - 1,100.00  
Model "F" Pony Tonneau, 25-30 H. P., 4-passenger 1,200.00  
Wheel Base of Models "C," "D," "E" and "F" is 107 inches.  
Model "L" Touring Car, 35-40 H. P., 5-passenger - \$1,500.00  
Model "M" Touring Car, 35-40 H. P., 7-passenger - 1,750.00  
Wheel base of Models "L" and "M" is 120 inches.

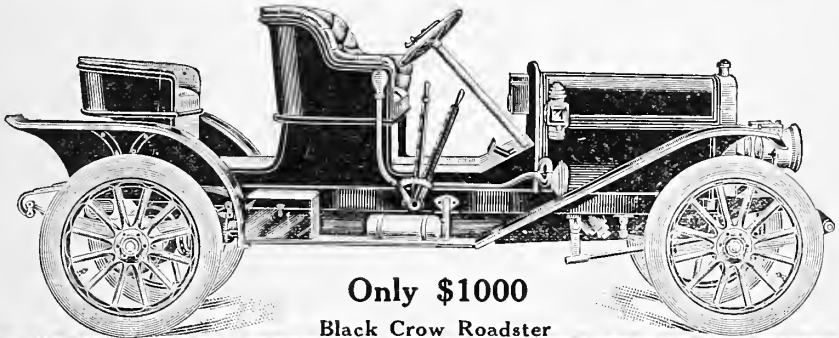
**OWNERS:**—Send for Catalog No. A12. Investigate the big values of just the car to suit your price.

Partial specifications are:—4-cylinder Noiseless Motors—Full 25-30 H. P.—Long Stroke—Constant Level Splash—Perfect Lubrication—Selective Type—Sliding Gear Transmission—Large Five-Bearing Crank Shaft—ALSO—With Each Car at No Extra Cost—Remy Magneto—Horn and Lamps.

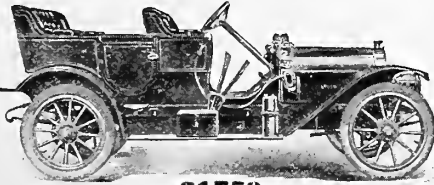
**BEFORE** closing for any car investigate Black-Crow Accessibility—Simplicity—Dependability—Speed and Rugged Sturdiness.

**BLACK MANUFACTURING CO.,** Main Offices, 215-17-19 W. Ohio St., Chicago, Ill.

Full 25-30  
H. P.  
  
107-Inch  
Wheel Base  
  
Model "C"



Only \$1000  
Black Crow Roadster



**\$1750**

ONE CHASSIS      THREE BODIES      ONE PRICE

## F.A.L-CAR

We seek the interest of automobile merchants and buyers who choose their cars with the calm, cold reasoning of business experience—who analyze a motor car by keenly comparing dollar-for-dollar value—and who refuse to be swayed by any other force than SHEER MERIT. Of such we request the opportunity of submitting a few concise, interesting facts,—we have no space to properly do so here.

Should these facts merit your patronage—well and good. If not—we will not annoy you with persistent solicitations. We are ready NOW—only waiting the arrival of your request.

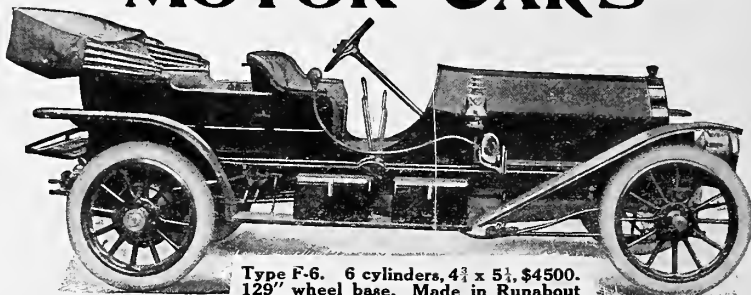
**FAL MOTOR COMPANY**  
No. 163-172 N. May Street    ::    ::    ::    ::    Chicago, Illinois

**GASOLINE PLEASURE VEHICLES—Continued**

- Vandewater & Co., 71-79 Prince St., Elizabeth, N. J. "Correja."  
 Van Wambeke, H. F. & Sons, Elgin, Ill. "Van."  
 Veerac Motor Co., 529-31 Metropolitan Bldg., Minneapolis, Minn. "Veerac."  
 Velie Motor Vehicle Co., Moline, Ill. "Velie."  
 Vickers Motor Car Co., The, Coshocton, Ohio. "Vickers."  
 Victor Automobile Co., Ridgeville, Ind. "Senator."  
 Waldron Runabout Mfg. Co., Kankakee, Ill.  
 Waltham Mfg. Co., Waltham, Mass. "White."  
 Warren Motor Car Co., The, Detroit, Mich. "Warren-Detroit."  
 Watt Motor Co., 564 Porter St., Detroit, Mich. "Watt."  
 Wayne Works, Richmond, Ind. "Richmond."  
 Wehrle, W. W. & A. T., Newark, O.  
 Welch Company of Detroit, 1302-18 Jefferson Ave., East, Detroit, Mich. "Welch" & "Welch-Detroit."  
 Westcott Motor Car Co., Richmond, Ind.  
 White, The Geo. Buggy Co., Rock Island, Ill. "George White."  
 ★White Co., The, Rose Bldg., Cleveland, Ohio. "White."  
 Wilcox, H. E. Motor Car Co., 1030 Marshall St., Minneapolis, Minn. "Wilcox."  
 ★Willys-Overland Co., Toledo, O. "Overland."  
 ★Winton Motor Carriage Co., Berea Road, Cleveland, Ohio. "Winton."  
 Wisconsin Motor Car Co., Janesville, Wis. "Wisco."  
 Wonder Motor Car Co., 4116-18 Penn St., Kansas City, Mo.  
 Worth Motor Car Mfg. Co., Kankakee, Ill.  
 ★Zimmerman Mfg. Co., Auburn, Ind. "Zimmerman."

**GASOLINE COMMERCIAL VEHICLES**

- A.B.C. Motor Vehicle Mfg. Co., 3915 Morgan St., St. Louis, Mo. "A.B.C."  
 Abendroth & Root Mfg. Co., 320 Fifth Ave., N. Y. City. "Frontenac."  
 Abresch-Cramer Auto Truck Co., 4th & Poplar Sts., Milwaukee, Wis. "Abresch."  
 ★Acorn Motor Car Co., Cincinnati, O. "Acorn."  
 American La France Fire Engine Co., Elmira, N. Y. (Chemical fire engines.)  
 American Locomotive Co., Auto Dept., 1886 Broadway, N. Y. City. "Alco."  
 ★American Motor Truck Co., Detroit, Mich. "American."  
 ★American Motor Truck Co., Lockport, N. Y. "American."  
 Anderson Carriage Mfg. Co., Anderson, Ind. "Anderson."  
 Armleder, The O. Co., Plum, Charles & Twelfth Sts., Cincinnati, Ohio.  
 Atlanta Motor Car Co., Atlanta, Ga. "White Star."  
 Atlas Motor Car Co., 88 Birnie Ave., Springfield, Mass. "Atlas." (Also taxicabs.)  
 ★Atterbury Motor Car Co., The, Elmwood & Hertel Aves., Buffalo, N. Y. "Buffalo." (Trucks, sightseeing cars & hotel omnibuses.)  
 ★Autocar Co., The, Ardmore, Pa. "Autocar."  
 Auto-Tri Manufacturing Co., 1738 Elmwood Ave., Buffalo, N. Y. "Auto-Tri Package Car."  
 Avery Co., Peoria, Ill. "Avery."  
 B. C. K. Motor Car Co., York, Pa. "Kline Kar."  
 ★Bergdoll, Louis J. Motor Co., 31st & Dauphin Sts., Phila., Pa. "Bergdoll." (Taxicabs & town cars.)  
 Beyster Detroit Co., 1329-31 Woodward Ave., Detroit, Mich.

**MOTOR CARS**

Type F-6. 6 cylinders,  $4\frac{1}{2} \times 5\frac{1}{2}$ , \$4500.  
 129" wheel base. Made in Runabout  
 and Toy Tonneau.

Type D-25. 4 cylinders,  $4\frac{1}{2} \times 4\frac{1}{2}$ . Price, \$2500.  
 110" wheel base. Runabout, Toy Tonneau and  
 Touring Car.

Type C-50. 4 cylinders,  $4\frac{1}{2} \times 5\frac{1}{2}$ . Price, \$3000.  
 114" wheel base. Runabout, Toy Tonneau and  
 Touring Car.

Type B-50. 4 cylinders,  $4\frac{1}{2} \times 5\frac{1}{2}$ . Price, \$3500.  
 122" wheel base. 7-Passenger Touring Car.

There is no better automobile in the world than  
 the "Pennsylvania."

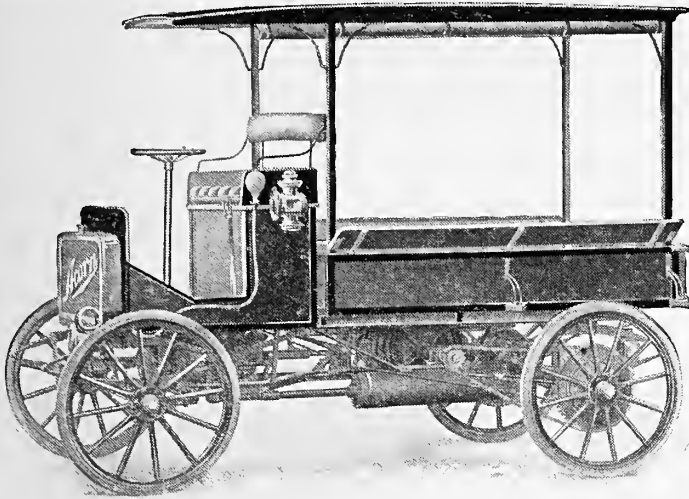
DON'T FAIL TO EXAMINE IT.

There is still some unplaced territory for the right kind of agent.

**Pennsylvania Auto Motor Company**

**Bryn Mawr, Penna.**





## THE ACORN

### Commercial Car

**"BUILT IN THE HILLS"**

Every car is tested with an overload over Cincinnati hills before shipment.

This means that it will give satisfaction anywhere.

It has the power, it is built to wear and it will wear.

### ANY STYLE BODY BUILT TO ORDER

The dealer who secures the agency for a good, light delivery car has made his fortune. Write for full information.

## THE ACORN MOTOR CAR CO.

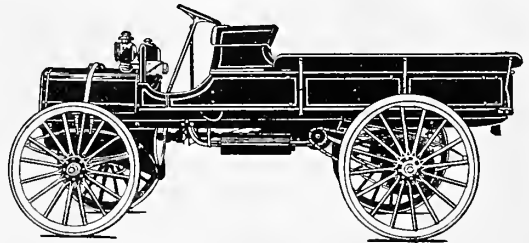
FIFTH, EGGLESTON AVENUE AND LOCK STREET  
CINCINNATI, OHIO

The only car which completed the recent Kansas City Reliability Run with a perfect score.

### The Chase Motor Wagon

The Chase Wagon used was not new but had been in active service for several months. Its rated capacity is only 1,000 lbs. but it carried, in this contest 1,350 lbs. The road conditions were as unfavorable as could be imagined.

The splendid protection of all working parts on the CHASE WAGONS and the high wheels enabling the wagon to get through the road obstructions with minimum power, contributed to this victory; but,



#### The Principal Cause

was the wonderfully simple, reliable, two-cycle, air-cooled motor.

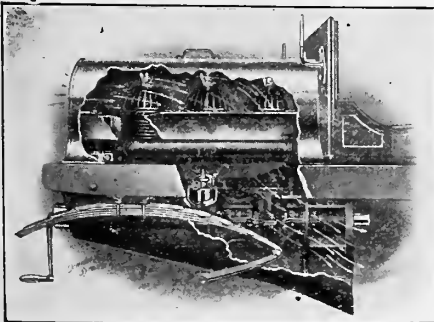
The CHASE system of air cooling which does away with fans, belts and gears, first made the air-cooled motor practical for automobile use. By the way, CHASE cars don't smoke.

*Write for free catalogue*

## Chase Motor Truck Company

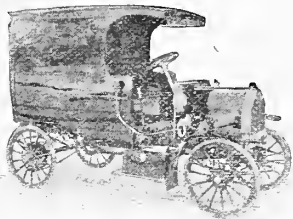
Dept. C.

Syracuse, N. Y., U. S. A.



**GASOLINE COMMERCIAL VEHICLES—  
Continued**

- ★Black Mfg. Co., 215-219 E. Ohio St., Chicago, Ill. "Black-Crow." (Crow Motor Car Co., factory.)
- British Napier Motors, 47 Union Ave., Jamaica Plain, Boston, Mass. "British Napier." (Imported.)
- Brodesser, P. H. & Co., Milwaukee, Wis. "Brodesser."
- Brunner Motor Car Co., 988 Ellicott St., Buffalo, N. Y. "Brunner."
- ★Brush Runabout Co., 14 Baltimore Ave., W., Detroit, Mich. "Brush."
- ★Buckeye Mfg. Co., Anderson, Ind. "Lambert."
- Buckeye Wagon & Motor Car Co., 34-36 N. Canal St., Dayton, Ohio.
- Buffalo Auto-Truck & Motor Co., Sussex St., Buffalo, N. Y.
- Buggyear Co., The, John St. & Armory Ave., Cincinnati, Ohio.
- Burt Mfg. Co., Clinton & Fulford Sts., Kalamazoo, Mich.
- C. & G. Auto Co., 312 N. 43rd St., N. Y. City.
- Carlson Motor & Truck Co., Phila., Pa. "Carlson."
- Cartercar Co., Pontiac, Mich. "Cartercar."
- Cass Motor Truck Co., 308 Moffet Block, Detroit, Mich.
- Champion Wagon Co., Owego, N. Y. "Champion." (Gasoline-electric.)
- ★Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y. "Chase."
- Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."
- Clark, Edward S., 242 Freeport St., Boston, Mass.
- Clark, A. C. & Co., Grand Crossing, Chicago, Ill. "Clark."
- Clark & Co., Lansing, Mich. "Clark."
- Clark-Hatfield Auto Co., Oshkosh, Wis. "Clark-Hatfield."
- Clark Motor Car Co., Shelbyville, Ind. "Clark."
- Commercial Motor Car Co., The, 403 Times Bldg., N. Y. City. (To order, also imported trucks.)
- Cortland Wagon Co., Cortland, N. Y. "Cortland."
- ★Couple Gear Freight Wheel Co., The, 560 Buchanan St., Grand Rapids, Mich. (Gas electric.)
- Crane & Breed Mfg. Co., 1227-59 W. 8th St., Cincinnati, Ohio. (Gasoline ambulances, casket wagons & hearses.)
- ★Croton-Keeton Motor Co., The, Massillon, Ohio. "Croton-Keeton." (Taxicabs.)
- Darby Motor Car Co., 530 De Belviere Ave., St. Louis, Mo. "Darby."
- Decatur Motor Car Co., Decatur, Ind. "Coppock."
- DeDion Bouton Selling Branch, 1649 Broadway, N. Y. City. "DeDion-Bouton."
- De Schaum Motor Syndicate Co., 316 Prudential Bldg., Buffalo, N. Y. "De Schaum Buffaloes."
- Duplex-Power Car Co., 401-25 W. Lovett St., Charlotte, Mich. "D-P."
- ★Duryea, Chas. E., Reading, Pa. "Duryea."
- Eastern Power Truck Co., Providence, R. I.
- Economy Motor Car Co., Joliet, Ill.
- Eureka Motor Car Mfg. Co., 3025-29 Olive St., St. Louis, Mo. "Eureka."
- Ewing Automobile Co., Geneva, Ohio. "Ewing." (Taxicabs.)
- Fal Motor Co., 171 N. May St., Chicago, Ill. "Fal-Car."
- Ford Motor Co., 254 Piquette Ave., Detroit, Mich. "Ford." (Taxicabs.)
- Four Traction Auto Co., The, Mankato, Minn. "Kato 4-Drive."
- Franklin Commercial Car Co., Franklin, Pa.
- Franklin, H. H. Mfg. Co., Automobile Dept., 402 S. Geddes St., Syracuse, N. Y. "Franklin."



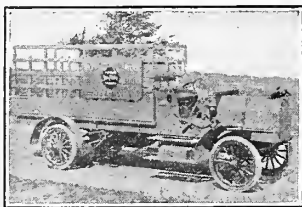
MODEL A

THE  
**Buffalo**  
COMMERCIAL  
CARS



MODEL K

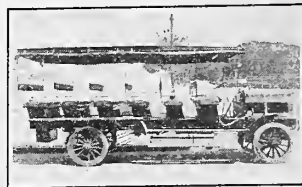
Ask the man who owns one or more of our trucks and delivery wagons, and he will tell you that the "Buffalo" is the car of durability and simplicity, and he has found it a money-saving as well as a money-making proposition. Write for our catalogue giving general details of our heavy trucks, coal-dumping trucks, sight-seeing cars and hotel buses.



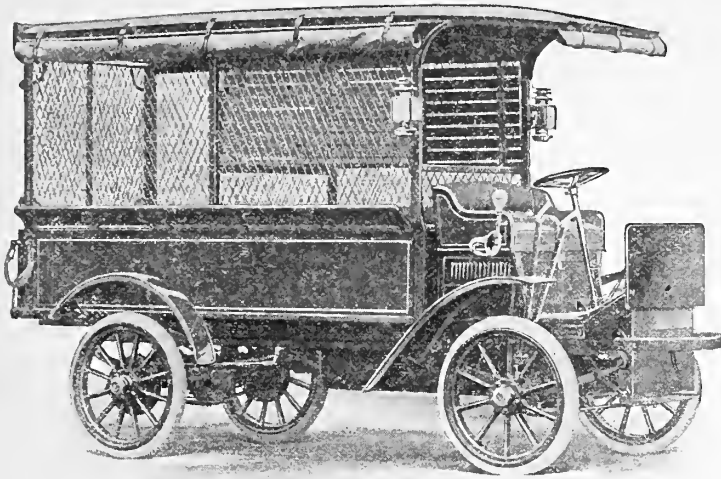
MODEL N

**Atterbury  
Motor Car Company**

BUFFALO, N. Y.



MODEL I



## Autocar Commercial Wagon

Every commercial wagon that the Autocar Company puts out is an advertisement that sells another.

Why? Because "continuous efficiency," which we guarantee, is bound to tell in the long run.

Business expenses are figured too closely nowadays for any business concern to repeat a bad purchase. A wagon that piles up repair bills must soon go down and out.

Accidents will happen to the Autocar, of course. No wagon was ever made that was immune. But we know how it's built, we know its superb construction, and that's the reason we guarantee continuous efficiency. Hauls up to 3000 pounds. Covers more ground than six horses.

*Licensed under Selden Patents*

## **The Autocar Company**

**Ardmore, Pa.**

**Commercial and Pleasure Vehicles**

**249 North Broad Street  
Philadelphia**

**80th and Broadway  
New York**

**GASOLINE COMMERCIAL VEHICLES — Continued**

- Fuller Buggy Co., Jackson, Mich. "Fuller."  
 Fuller Co., The, Russel St. & Boulevard, Detroit, Mich. (Also gasoline-electric.)  
 Gaeth Automobile Co., The, 2553 W. 25th St., Cleveland, Ohio. "Gaeth."  
 ★The Grabowsky Power Wagon Co., 68-72 Champlain St., Detroit, Mich. "Grabowsky."  
 Gramm-Logan Motor Car Co., Bowling Green, Ohio. "Gramm-Logan."  
 ★Hart-Kraft Motor Co., York, Pa. "Hart-Kraft."  
 Holsman Auto Co., 444 Monadnock Bldg., Chicago, Ill. "Holsman."  
 Ideal Mfg. Co., Portsmouth, Ohio. "Ideal."  
 Industrial Automobile Co., Elkhart, Ind. "Federal."  
 International Harvester Company of America, 7 Monroe St., Chicago, Ill. "International Auto Wagon."  
 Jewel Carriage Co., Carthage, Ohio. "Breeze."  
 Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.  
 Kelly Motor Truck Co., The, Springfield, Ohio.  
 Knox Automobile Co., Wilbraham Road, Springfield, Mass. "Knox."  
 Koeb-Thompson Motors Co., The, Leipsic, O.  
 Lambert Motor Truck Co., Anderson, Ind. "Lambert."  
 Lanpher Motor Buggy Co., Carthage, Mo. "Lanpher."  
 Lear, Oscar Automobile Co., Springfield, Ohio. "Frayser-Miller."  
 Lende Automobile Mfg. Co., 617 Guaranty Bldg., Minneapolis, Minn. "Lende."  
 Luitweiler Pumping Engine Co., 123 Ames St., Rochester, N. Y. "Luitweiler." (Fire Engines.)  
 Lumund Motor Car Co., Rutherford, N. J.  
 McCrea Motor Truck Co., The, Cleveland, O. "McCrea."  
 ★McIntyre, W. H. Co., Auburn, Ind. "McIntyre."  
 Mack Bros. Motor Car Co., Allentown, Pa. "Manhattan."  
 Mais Motor Truck Co., The, Peru, Ind. "Mais."  
 Manlius Motor Co., Manlius, N. Y. "MMC."  
 Martin Carriage Works, York, Pa.  
 Maxwell-Briscoe Motor Co., Tarrytown, N. Y. "Maxwell."  
 Megow, C. F. Co., S. Milwaukee, Wis. "Champion."  
 Meiselbach Mfg. Co., North Milwaukee, Wis. "Meiselbach."  
 Metz Co., The, Waltham, Mass. "Metz Plan."  
 ★Mitchell-Lewis Motor Co., Racine, Wis. "Mitchell." (Also taxicabs.)  
 ★Monitor Automobile Works, 315 Dearborn St., Chicago, Ill. "Monitor."  
 Morgan, R. L. Co., Cambridge & Milbury Sts., Worcester, Mass.  
 Motor Buggy Mfg. Co., 399 S. Third St., Minneapolis, Minn. "Acme."  
 Motor Car Repair Co., The, 509-515 W. 56th St., New York, N. Y. "Prodal."  
 Munsing Motor Car Co., Hoboken, N. J. "Munsing." (Also taxicabs.)  
 Neville, T., Oshkosh, Wis. "Neville." (Ambulances and hotel coaches.)  
 ★New Departure Mfg. Co., Bristol, Conn. "Rockwell" (taxicabs.)  
 Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. (To order.)  
 Packard Motor Car Co., Boulevard & Belt Line, Detroit, Mich. "Packard."  
 Parr Wagon Co., 2124 Penn Ave., Pittsburg, Pa. "Pittsburg."  
 Phoenix Auto Works, 366 Bridge St., Phoenixville, Pa. "Phoenix."  
 Plymouth Motor Truck Co., Plymouth, Ohio. "Plymouth."  
 ★Randolph Motor Car Co., 175 E. Randolph St., Chicago, Ill. "Randolph."

# Hart-Kraft Business Wagons

The most reliable and economical delivery wagon offered for 1910  
**Actual Experience is Proof of Our Claim**



Read the following condensed report of a Hart-Kraft Wagon which was operated from 22nd St., New York City, to Mt. Vernon, Pelham, New Rochelle and return DAILY. The wagon contained two men and the number of packages indicated by the deliveries. Gasoline figured at 15 cents per gallon; oil at 40 cents.

1 total miles	71 days, 4014½	Total average one day, 56.5 miles
" deliveries	" 317½	" 46 deliveries
" gasoline used	" 317½ gals.	" " " 4½ gallons
" oil used	" 124 pts.	" " " 1½ pints
" fuel cost	" \$53.83	" " " \$0.76

**Fuel Per Mile for Whole Period:**  
 12½ miles per gallon of gasoline      37½ miles per pint of oil

## The Hart-Kraft Wagon

Has Unit Power Plant, Magneto Ignition, Timken Bearings, Planetary Gearing, Multiple Disc Clutch, Double Opposed Motor, Water Cooled, Full Elliptic Springs, Double Chain Drive, Solid Tires.

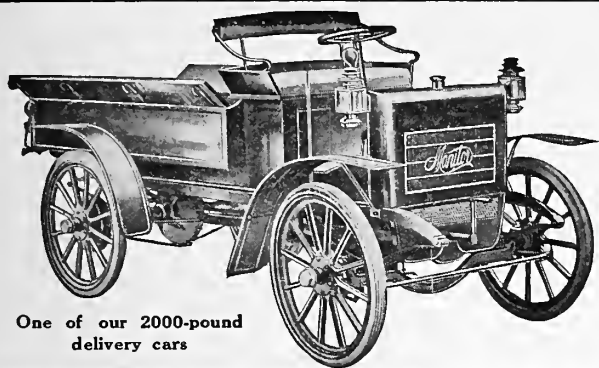
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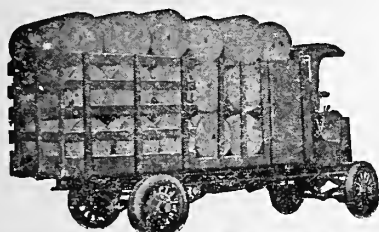
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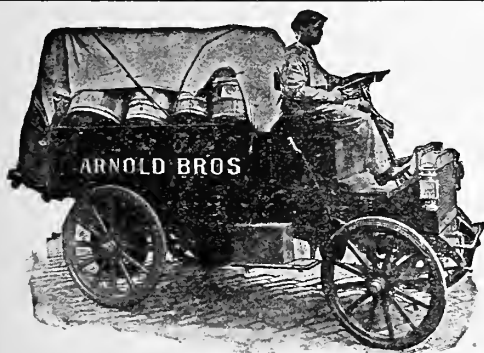
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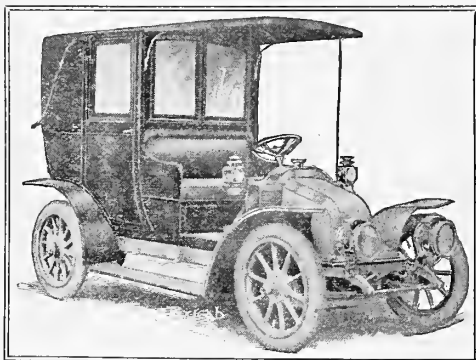
**GASOLINE COMMERCIAL VEHICLES — Continued**

- ★Rapid Motor Vehicle Co., Pontiac, Mich. "Rapid."
- Reliance Motor Truck Co., Owosso, Mich. "Reliance."
- Robinson-Loomis Motor Truck Co., Minneapolis, Minn. "Gopher" & "Reliance."
- Sampson, Alden, Mfg. Co., Pittsfield, Mass. "Sampson."
- Saurer Motor Truck Co., 400 W. Randolph St., Chicago, Ill. "Saurer."
- Sayers & Scovill Co., The, Cincinnati, Ohio. "Sayers & Scovill."
- Schmidt Bros. Co., 7100 S. Chicago Ave., Chicago, Ill. "Schmidt F. C. S."
- Seitz Automobile & Transmission Co., 225-229 Beecher Ave., Detroit, Mich.
- Sheffield Car Co., Three Rivers, Mich.
- Shop of Seibert, The, 530-32 Ontario St., Toledo, Ohio.
- Speedwell Motor Car Co., Dayton, O. "Speedwell."
- Spokane Motor Car Co., The, Spokane, Wash. (Sight seeing cars, hotel buses, police patrols & ambulances.)
- Standard G. E. Power Co., cor. 50th & Lancaster Ave., Philada., Pa. "Keystone" & "Standard."
- Star Motor Car Co., 605-08 Law Bldg., Indianapolis, Ind.
- Stephenson Motor Car Co., 188 8th St., Milwaukee, Wis. "Utility."
- Sterling Vehicle Co., Harvey, Ill. "Sterling."
- Sternberg Mfg. Co., Milwaukee, Wis. "Sternberg."
- Studebaker Automobile Co., South Bend, Ind. "Studebaker."
- Sullivan Motor Car Co., Rochester, N. Y. "Sullivan Car."
- Sultan Motor Co., 1659 Broadway, New York City. "Sultan."
- Swift Automobile Co., Detroit, Mich.

- ★Thomas Motor Cab Co., 1738 Elmwood Ave., Buffalo, N. Y. "Thomas." (Taxicabs.)
- Torbensen Motor Car Co., 610 Bloomfield Ave., Bloomfield, N. J. "Torbensen."
- United States Motor Truck Co., Cincinnati, O.
- ★Van Dyke Motor Car Co., 1221 Ford Bldg., Detroit, Mich. "Van Dyke."
- Van Wambeke, H. F. & Sons, Elgin, Ill. "Van."
- Veerac Motor Co., 529-31 Metropolitan Bldg., Minneapolis, Minn. "Veerac."
- Waldron Runabout Mfg. Co., Kankakee, Ill.
- Webb Motor Fire Apparatus Co., Vincennes, Ind. "Webb." (Fire engines, chemical engines, combination fire and hose wagons, chiefs' runabouts, etc.)
- Weyher Mfg. Co., The, Whitewater, Wis. "Weyher."
- ★White Co., The, Rose Bldg., Cleveland, Ohio. "White."
- Whitesides Wheel Co., West 10th & Canal Sts., Indianapolis, Ind. "Vaughn."
- Wilcox, H. E. Motor Car Co., 1030 Marshall St., Minneapolis, Minn. "Wilcox."
- Winkler Bros. Mfg. Co., South Bend, Ind.
- Worth Motor Car Mfg. Co., Kankakee, Ill.

**ELECTRIC PLEASURE VEHICLES**

- Anderson Carriage Co., Detroit, Mich. "Detroit."
- Babcock Electric Carriage Co., 226 W. Utica St., Buffalo, N. Y. "Babcock."
- Bailey, S. R. & Co., Amesbury, Mass. "Bailey."
- ★Baker Motor Vehicle Co., The, Cleveland, O. "Baker."



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Because the long experience of manufacture, combined with the skilled and careful study of conditions to be met, have resulted in a cab, the maintenance of which is the lowest and the efficiency the highest. Consequently it is the

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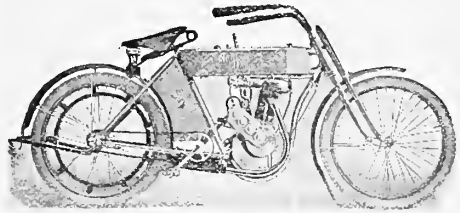
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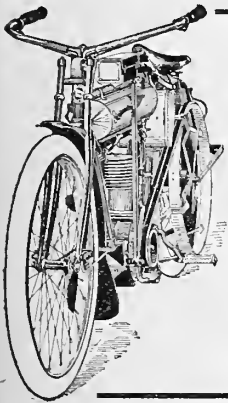


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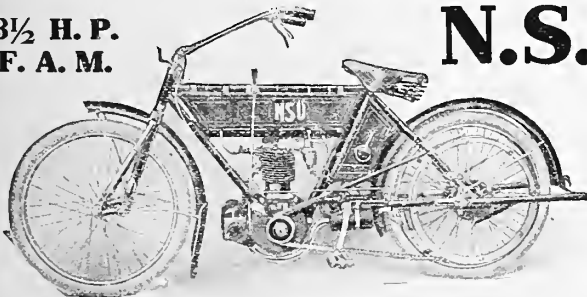
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- Broc Carriage & Wagon Co., The, 1665 E. Fortieth St., Cleveland, O. "Broc."  
 Brunn's Carriage Mfg. Co., 1140-48 Main St., Buffalo, N. Y.  
 Church Balance Gear Co., Grand Rapids, Mich. "Couple-Gear."  
 ★Columbia Motor Car Co., Hartford, Conn. "Columbia."  
 Columbus Buggy Co., The, Columbus, O. "Columbus."  
 Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind. "Pratt-Elkhart."  
 Fritchle Automobile & Battery Co., The, 1510-30 Clarkson St., Denver, Colo. "Fritchle."  
 Ideal Electric Co., 444 W. Indiana St., Chicago, Ill. "Ideal."  
 Kimball, C. P. & Co., 315-317 Michigan Ave., Chicago, Ill.  
 Lansden Co., The, 54 Lackawanna St., Newark, N. J. "Lansden."  
 Ohio Electric Carriage Co., The, Toledo, O. "Ohio."  
 Rauch & Lang Carriage Co., The, 631 Superior St., Cleveland, O. "Rauch & Lang."  
 Standard G. E. Power Co., cor. 50th & Lancaster Ave., Phila., Pa. "Keystone" & "Standard."  
 Studebaker Automobile Co., South Bend, Ind. "Studebaker."  
 Toledo Electric Vehicle Co., Collingwood & Delaware Aves., Toledo, Ohio.  
 United States Motor Co., 505 5th Ave., N. Y. City. (Controlling the Columbia Motor Car Co.)  
 ★Waverley Co., The, 139 S. East St., Indianapolis, Ind. "Waverley."  
 Woods Motor Vehicle Co., 2515-21 Calumet Ave., Chicago, Ill. "Woods."

**ELECTRIC COMMERCIAL VEHICLES**

- ★American Motor Truck Co., Lockport, N. Y. "American."  
 ★Atterbury Motor Car Co., The, Elmwood & Hertel Aves., Buffalo, N. Y. "Buffalo." (Trucks & hotel omnibuses.)  
 Automobile Maintenance & Mfg. Co., 213-19 S. Green St., Chicago, Ill.  
 ★Baker Motor Vehicle Co., The, Cleveland, O. "Baker."  
 Champion Wagon Co., Owego, N. Y. "Champion." (Also gasoline-electrics.)  
 Commercial Motor Car Co., The, 403 Times Bldg., N. Y. City.  
 Commercial Truck Co. of America, 27th & Brown Sts., Phila., Pa.  
 ★Couple Gear Freight Wheel Co., The, 560 Buchanan St., Grand Rapids, Mich. (Also gas-electric.)  
 Fuller Co., The, Russel St. & Boulevard, Detroit, Mich. (Gasoline-electric.)  
 General Vehicle Co., L. 1. City, N. Y.  
 Lansden Co., The, 54 Lackawanna St., Newark, N. J. "Lansden."  
 Pittsburgh Motor Vehicle Co., 5722 Ellsworth Ave., Pittsburgh, Pa. "Pittsburgh."  
 Standard G. E. Power Co., 50th & Lancaster Ave., Phila., Pa. "Keystone" & "Standard." (Gasoline-electric.)  
 Studebaker Automobile Co., South Bend, Ind. "Studebaker."  
 Washington Motor Vehicle Co., Washington, D. C. "Capitol."  
 ★Waverley Co., The, 139 S. East St., Indianapolis, Ind. "Waverley."

**STEAM PLEASURE VEHICLES**

- Clark, Edward S., 242 Freeport St., Boston, Mass.  
 Jay, Webb Motor Co., 2300 Wabash Ave., Chicago, Ill.

- Lane Motor Vehicle Co., Poughkeepsie, N. Y. "Lane."  
 Ross, Louis S., Crafts St., Newtonville, Mass. "Ross."  
 Stanley Motor Carriage Co., Newton, Mass. "Stanley."  
 ★White Co., The, Rose Bldg., Cleveland, Ohio. "White."

**STEAM COMMERCIAL VEHICLES**

- American La France Fire Engine Co., Elmira, N. Y. (Fire engines, hose wagons & chemical fire engines.)  
 Halsey, James T., 336 York Ave., Phila., Pa.  
 Michigan Steam Motor Co., Pike & Garland Sts., Pontiac, Mich. (Railroad inspection.)  
 ★White Co., The, Rose Bldg., Cleveland, Ohio. "White."

**MOTOR CYCLES**

- ★American Motor Co., 705 Center St., Brockton, Mass. "M. M."  
 American Motor Cycle Co., Wells & Schiller Sts., Chicago, Ill. "American."  
 Armac Motor Co., 472 Carroll Ave., Chicago, Ill. "Armac."  
 ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor."  
 Bradford Co., The, Delaware Ave. & Tatnall St., Wilmington, Del. "Bradford."  
 Bradley Motor Co., 268 Diamond St., Phila., Pa. "Bradley."  
 Bressler, I. N. & Son, 406-08 E. Third St., Sterling, Ill. "Heaton."  
 Brown & Beck, 1437 Tremont St., Denver, Colo. "Apache."  
 Chicago Motorcycle Works, 732 Sheridan Rd., Chicago, Ill. "Meteor." (Spring frame.)  
 ★Consolidated Mfg. Co., Toledo, O. "Yale."  
 Crouch Motor Co., Stoneham, Mass. "Crouch."  
 Duck, A. W., 427 15th St., Oakland, Cal. "Duck."  
 Eagle Motor Works, 1111 East Franklin Ave., Minneapolis, Minn. "Eagle."  
 ★Emblem Mfg. Co., Angola, N. Y. "Emblem."  
 ★Excelsior Supply Co., 233-37 Randolph St., Chicago, Ill. "Excelsior."  
 Fowler-Manson-Sherman Cycle Mfg. Co., 900-910 W. Lake St., Chicago, Ill. "Manson."  
 Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo. "Geer Green Egg."  
 Great Western Mfg. Co., La Porte, Ind. "Crown."  
 ★Greyhound Motor Works, 1443 Niagara St., Buffalo, N. Y. "Greyhound."  
 ★Harley-Davidson Motor Co., 3300 Chestnut St., Milwaukee, Wis. "Harley-Davidson."  
 ★Hendee Mfg. Co., 837 State St., Springfield, Mass. "Indian."  
 Herring-Curtiss Co., Hammondsport, N. Y. "Curtiss."  
 Hilaman, A. L. Co., Moorestown, N. J. "Dependable Hilaman."  
 Hornecker Motor Mfg. Co., The, Geneseo, Ill. "Torpedo."  
 Jencick Motor Mfg. Co., Port Chester, N. Y. (Gasoline.)  
 Keller & Risque Motor Co., The, 20 W. 3rd St., St. Paul, Minn. "Tourist." (Two-speed.)  
 Kiefler Motor Works, 184 Broadway, Buffalo, N. Y. "Kiefler."  
 Kokomo Motorcycle Co., Kokomo, Ind. "Kokomo."  
 Marvel Motorcycle Co., Hammondsport, N. Y. "Marvel."  
 Merkel-Light Co., The, Pottstown, Pa. ("Merkel" belt drive & "Light" chain drive.)  
 Miami Cycle & Mfg. Co., Grand Ave., Middletown, O. "Racycle."

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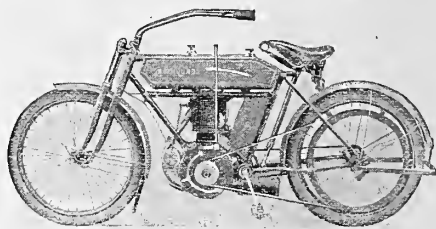
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**MOTOR CYCLES—Continued**

- Miller, Chas. E., Anderson, Ind.  
 Minneapolis Motorcycle Co., The, 517 S. 7th St., Minneapolis, Minn. "Minneapolis." (Two speed.)  
 ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "N.S.U."  
 ★New Era Autocycle Co., The, Dayton, O. "New Era Auto-Cycle."  
 ★Pierce Cycle Co., The, 6-22 Hanover St., Buffalo, N. Y. "Pierce."  
 Prospect Motor Co., 1900 Broadway, N. Y. City. "Simplex," "Allright" (imported.)  
 ★Reading Standard Co., Reading, Pa. "R-S."  
 ★Reliance Motor Cycle Co., Owego, N. Y. "Reliance."  
 Royal Motor Works Co., Worcester, Mass. "Royal Pioneer."  
 S. D. Mfg. Co., 155 Ridgewood Ave., Brooklyn, N. Y. "S. D."  
 Shaw Mfg. Co., Galesburg, Kans. "Shaw."  
 Stahl, C. V., Motor Works, N. E. Cor. 29th & Diamond Sts., Philadelphia, Pa. "CVS."  
 Thiem Mfg. Co., The, Minneapolis, Minn. "Thiem."  
 Wagner Motor Cycle Co., 321-25 Cedar St., St. Paul, Minn. "Wagner."  
 Walton Motor Co., Inc., Broadway and Merrick Road, Lynbrook, L. I., N. Y. "Midget Bi-Car."

**MOTOR BOATS**

- Adams, W. Irving & Son, East Boothbay, Me. (Gasoline.)  
 Ainsworth, H. B., 412 N. Franklin St., Madison, Wis. (Gasoline.)  
 Apel, Adolph E., Ventnor, Atlantic City, N. J. (Gasoline.)  
 Atkin-Wheeler, Halesite, Huntington Harbor, L. I., N. Y. (Gasoline.)  
 Atlantic Co., The, Amesbury, Mass. (Gasoline.)  
 Bath Marine Construction Co., Bath, Me. (Gasoline.)  
 Beers Bros. Engine Co., Portland Ave. & Norton St., Rochester, N. Y. "Beers." (Gasoline.)  
 Bellows, M. S., Chateaugay Lake, N. Y. (Gasoline.)  
 Bintliff, W. T., Plainfield, N. J. "Alpha." (Gasoline.)  
 Bonney, John C. G., 21 Platt St., N. Y. City. (Gasoline & kerosene.)  
 Brighton Boat & Supplies Co., Menasha, Wis. (Gasoline, naphtha, electric, steam & producer gas.)  
 Camden Anchor-Rockland Machine Co., Camden, Me. "Knox." (Gasoline.)  
 Cape Cod Power Dory Company, Wareham, Mass. (Gasoline.)  
 Carleton Canoe Co., 700 Main St., Old Town, Me. "Carleton." (Gasoline canoes.)  
 Cayuga Motor Boat Co., Cayuga, N. Y. (Gasoline.)  
 Chaisson, George, Swampscott, Mass. (Gasoline.)  
 Chamberlain, Wm. H., 14 Orne St., Marblehead, Mass. (Gasoline.)  
 Champaign Bros., Ithaca, N. Y.  
 Cleveland Auto Boat Mfg. Co., 1036 River Ave., Cleveland, O. (Gasoline & steam.)  
 Cooley Mfg. Co., Waterbury, Vt. (Gasoline.)  
 Cuthbert, A. G., 1750 N. Rockwell St., Chicago, Ill. (Gasoline.)  
 Davis Boat Works, Sandusky, O. (Gasoline.)  
 Defoe Boat & Motor Works, Bay City, Mich. (Gasoline.)  
 Detroit River Canoe Works, 274-80 Wight St., Detroit, Mich. "Pa-Hak-Ha." (Gasoline.)  
 Electric Launch Co., The, 179 Ave. A, Bayonne, N. J. "Elco." (Electric, gasoline & steam.)  
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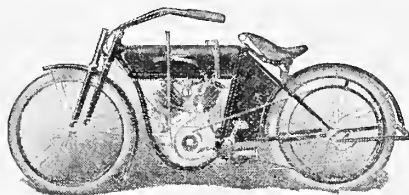
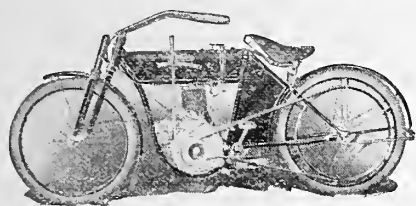
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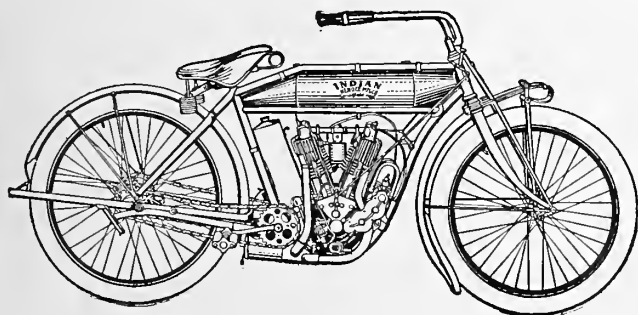


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 Fenton, A., Gloucester, Mass. (Gasoline.)  
 Fenton, David, Manchester-by-the-Sea, Mass. (Gasoline, to order.)  
 Fore River Ship Building Co., Quincy, Mass. (Gasoline.)  
 Gas Engine Power Co. & Chas. L. Seabury & Co., Morris Heights, N. Y. (Naphtha, gasoline & steam.)  
 Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich. (Gasoline.)  
 Gray Motor Co., Leib & Larned Sts., Detroit, Mich. (Gasoline.)  
 Hanksraft Co., 1220 Michigan Ave., Madison, Wis. "Hanksraft" (Gasoline.)  
 Horton Boat, Engine & Supply Co., 90 South Ave., Rochester, N. Y. (Gasoline.)  
 Hunter-Weckler Boat Co., The, McHenry, Ill. (Gasoline.)  
 Johnson, M. J., Leschi Park, Seattle, Wash. (Gasoline.)  
 Kershaw-Williams Co., 29-33 Haverhill St., Boston, Mass. "K-W."  
 Lawley, Geo. & Son Corp., 696 E. First St., South Boston, Mass. (Gasoline.)  
 Lindley, W. H. Co., Main & Canal Sts., Canastota, N. Y. "Lindley." (Gasoline.)  
 Lisk, Geo. A., 1193-5 Jefferson Ave., W., Detroit, Mich. "Lisk." (Gasoline.)  
 Manhasset Shipbuilding & Repair Co., Port Washington, L. I., N. Y. (Gasoline.)  
 Mather, The C. B. Corporation, Newburyport, Mass. (Gasoline.)  
 Mathison Boat Co., Cor. River & Bowen Sts., Oshkosh, Wis. "Mathison."  
 Matthews Boat Co., The, Port Clinton, O. "Matthews." (Gasoline, steam & kerosene.)  
 Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich. (Steel & wood, gasoline.)  
 Milton Boat Works, Rye, N. Y. (Gasoline.)  
 Milton, T. M. & Son, Brewerton, N. Y. (Gasoline.)  
 Mullins, W. H. Co., Salem, O. "Mullins." (Pressed steel, gasoline.)  
 Murray, Irving C., 447 E. Front St., Traverse City, Mich. (Gasoline.)  
 Murray & Tregurtha Co., South Boston, Mass. (Gasoline.)  
 New York Motor Boat Co., City Island, N. Y. (Gasoline.)  
 New York Yacht, Launch & Engine Co., The, Morris Heights, N. Y. City. (Gasoline.)  
 Niagara Motor Boat Co., North Tonawanda, N. Y. (Gasoline.)  
 Nilson Yacht Building Co., The, Baltimore, Md. (Gasoline.)  
 Nock, F. S., East Greenwich, R. I. (Gasoline & steam.)  
 Palmer Boat Co., Highland Park, Ill. (Gasoline.)  
 Petoskey Boat Co., 115 Midway, Petoskey, Mich. (Gasoline.)  
 Pierce Motor Co., The, Racine, Wis. "Pierce." (Gasoline.)  
 Portage Boat & Engine Co., 105 Mullet St., Portage, Wis. (Gasoline.)  
 Powell Cove Boat Co., 20th St. & N. Boulevard, College Point, L. I. (Gasoline.)  
 Pungs-Finch Auto & Gas Engine Co., 1524 Jefferson Ave., Detroit, Mich. (Gasoline.)  
 Racine Boat Company, 1203 Racine St., Racine, Wis. (Gasoline.)  
 Racine Boat Mfg. Co., Muskegon, Mich. "Racine." (Gasoline & steam.)  
 Red Wing Boat Mfg. Co., Red Wing, Minn. "Red Wing." (Gasoline.)  
 Rippley Steel Boat Co., Box O, Grafton, Ill. "Rippley." (Galvanized steel, gasoline.)  
 Rochester Gas Engine Co., 707 Driving Park Ave., Rochester, N. Y. "Rochester." (Gasoline.)  
 St. Paul Boat Co., St. Paul, Minn. (Gasoline.)  
 Schaefer Mfg. Co., Berlin, Wis. (Gasoline.)  
 Skaneateles Boat & Canoe Co., The, Skaneateles, N. Y. (Gasoline.)  
 Sparks, C. F. Machine Co., Alton, Ill. (Gasoline.)  
 Stamford Motor Co., Foundry, Water & Atlantic Sts., Stamford, Conn. (Gasoline.)  
 Stuart Co., John, Wollaston, Mass. (Gasoline.)  
 Susquehanna Marine Works Co., Havre de Grace, Md. (Gasoline.)  
 Tallmadge, J., Baldwinsville, N. Y. (Gasoline.)  
 1000 Island Boat & Engine Co., Morristown, N. Y. (Gasoline.)  
 Toppan Boat Mfg. Co., 25 Haverhill St., Boston, Mass. "Toppan." (Also knocked down dories, gasoline.)  
 Trombley & Coash Boat Works, 1218 N. Niagara St., Saginaw, W. S., Mich.  
 Truscott Boat Mfg. Co., St. Joseph, Mich. "Truscott." (Gasoline, steam & electric.)  
 Waterman Marine Motor Co., 1506-12 Fort St., West, Detroit, Mich. (Gasoline.)  
 Weckler Boat Co., Chicago, Ill. "Weckler." (Gasoline.)  
 Western Launch & Engine Works, Michigan City, Ind. (Gasoline.)  
 White, E. M. Co., Oldtown, Me. "White." (Gasoline.)  
 Whitehall Motor & Boat Co., Whitehall, N. Y. "Whitehall." (Gasoline.)  
 Wright, U. G., Paulsboro, N. J. (Gasoline.)  
 Wright, C. T. Engine Co., 1005 Speed St., Greenville, Mich. (Gasoline.)

## Flying Machines and Aeronautical Material

### AERIAL MODELS

Aeroflyer Company, Medford, Mass.

### AERONAUTICAL SUPPLIES

- Aeronovetly Co., The, Betz Bldg., Phila., Pa.  
 Auto & Aeronautic Supply Co., 2100 Broadway, N. Y. City. (Jobbers.)  
 International School of Aeronautics, Garden City, L. I., N. Y.  
 Kasmar, M. K., 1827 N. Paulina St., Chicago, Ill.  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. (Aeroplanes & balloon supplies.)  
 Robertson Aerial Co., The, Betz Bldg., Phila., Pa.  
 Rudolph, Wm. F., Broad & Wallace Sts., Phila., Pa.  
 Schneider, F. P., 1020 E. 178th St., N. Y. City.  
 Stevens, Leo, Box 181, Madison Square, N. Y. City. (Balloon supplies.)

### AEROPLANES

- Aero Supply Co., The, Cynwyd, Pa. "Aero." (To order.)  
 Bates, Carl, 104 W. Oak St., Chicago, Ill.  
 Burgess, W. Starling Co., Ltd., Marblehead, Mass. "Herring-Burgess." (Biplanes.)  
 Burlingame, Elmer, 928 Oliver Bldg., Boston, Mass. "Burlingame."  
 Easton Cordage Co., Easton, Pa. (To order.)  
 Erickson, Louis G., 29 Woodmont St., Springfield, Mass. "Ericka." (Biplanes.)  
 French-American Balloon Co., 4460 Chouteau Ave., St. Louis, Mo.

# Thor

## THE MOTORCYCLE SUPREME

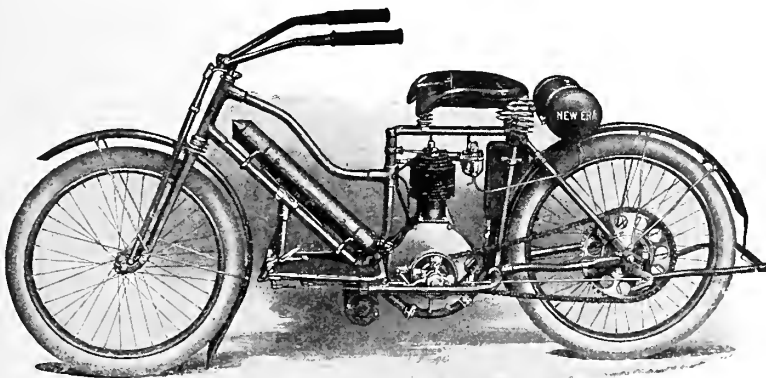
### AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave.,

CHICAGO, ILL.

A NEW ERA IN MOTORCYCLING was begun when  
THE NEW ERA AUTO-CYCLE made its appearance

It marked the beginning of real practicability and comfort



(Patent Pending)

Its long, low frame and spring-suspended, upholstered form seat and foot-board (instead of pedals), makes it available for all ages and sizes and conditions of mankind; its two-speed transmission makes it master of any and all hills, and renders possible the slow pace so necessary to safety and comfort on rough country roads and crowded city streets; its free engine (engine started by a crank like an automobile), makes it possible to start *anywhere* from a standstill and without even "jacking up" the machine. Lots of these ideas are being and will be copied, but don't you pay for manufacturers' experiments. You don't have to do so when the New Era offers them in perfect form.

WRITE FOR CATALOGUE AND AGENCY PROPOSITION

THE NEW ERA AUTO-CYCLE COMPANY :: No. 7 Dale Avenue, Dayton, Ohio

## AEROPLANES—Continued

Greene Co., The, 1777 Broadway, N. Y. City.  
"Greene."  
Hamilton, Thos. F., 208 30th Ave., Seattle,  
Wash. (Dumont type monoplanes &  
"Hamilton" biplanes.)  
Hansen & Snow, 549 S. Lake Ave., Pasadena,  
Cal. (Monoplanes.)  
Hayward, G. S., Brush Hill Road, Milton,  
Mass. (Biplanes & monoplanes.)  
Herring-Curtiss Co., Hammondsport, N. Y.  
"Curtiss."  
Kasmar, M. K., 1827 N. Paulina St., Chicago,  
Ill. "Kasmar."  
L. A. W. Motors Co., Inc., Providence, R. I.  
Manhattan Auto & Aeroplane Co., The, 1229  
S. Main St., Los Angeles, Cal. "Benson  
Paraoplane."  
Moller, J. A., New Rochelle, N. Y. (Mono-  
planes.)  
Rudolph, Wm. F., Broad & Wallace Sts.,  
Phila., Pa. (Monoplanes.)  
Scientific Aeroplane & Airship Co., Box 773,  
N. Y. City. "Beach." (Monoplanes.)  
Shneider, F. P., 1020 E. 178th St., N. Y. City.  
(Monoplanes & biplanes.)  
Stevens, Leo, Box 181, Madison Square, N. Y.  
City.  
Stenzy, A. F. P., 1019 Binney St., Baltimore,  
Md. "Stenzy's." (Monoplanes.)  
Wittmann, C. & A., 17 & 19 Ocean Terrace,  
Staten Island, N. Y. "Wittmann Stand-  
ard." (To order.)  
Wright Co., The, 1127 W. 3rd St., Dayton, O.  
"Wright Flyer."

## ALUMINUM ALLOY

(For Airship Trade.)

Kaiser, E., 42 Broadway, N. Y. City. "Avi-  
selva." (Imported.)

## BALLOONS

Baldwin, Thos. S., Box 73, Madison Square P.  
O., N. Y. City.  
French-American Balloon Co., 4460 Chouteau  
Ave., St. Louis, Mo.  
Hamilton, Thos. F., 208 30th Ave., Seattle,  
Wash. "Sylvan." (Hot air & gas.)  
Lewis, O. F., Saratoga Springs, N. Y.  
Myers, Carl E., Balloon Farm, Frankfort, N.  
Y.  
Stevens, Leo, Box 181, Madison Square, N. Y.  
City.

## BAMBOO

Deltour, J., Inc., 49 6th Ave., N. Y. City.

## CASTINGS

(For Airship Trade.)

Kaiser, E., 42 Broadway, N. Y. City. (Alu-  
minum alloy, imported.)  
★U. S. McAdamite Metal Co., 18-28 Rapelye  
St., Brooklyn, Mass.  
Wittmann, C. & A., 17 & 19 Ocean Terrace,  
Staten Island, N. Y. "Wittmann Stand-  
ard." (Light metal.)

## CLOTHING, Aviation

MacDonald & Campbell, 1334-36 Chestnut St.,  
Phila., Pa.

## COOKING UTENSILS

(For Aeroplanes.)

Kaiser, E., 42 Broadway, N. Y. City. (Alu-  
minum, imported.)

## CORD, Aviation

Aero Supply Co., The, Cynwyd, Pa. (Manu-  
facturers' Agents.)

## CUTOFFS FOR PARACHUTES

Hamilton, Thos. F., 208 30th Ave., Seattle,  
Wash. "Sylvan Neverfail."

## DIRIGIBLE BALLOONS

Baldwin, Thos. S., Box 73, Madison Square  
P. O., N. Y. City.  
French-American Balloon Co., 4460 Chouteau  
Ave., St. Louis, Mo.  
Hamilton, Thos. F., 208 30th Ave., Seattle,  
Wash. (Dumont type.)  
Kaiser, E., 42 Broadway, N. Y. City. (Im-  
ported.)  
Myers, Carl E., Balloon Farm, Frankfort, N.  
Y.  
Stevens, Leo, Box 181, Madison Square, N. Y.  
City.

## ENGINEERS, Aerial

Myers, Carl E., Balloon Farm, Frankfort, N.  
Y.



## FABRICS, Aeronautic

Aero Supply Co., The, Cynwyd, Pa. (Silk, linen & cotton; manufacturers' agents.)  
 Baldwin, Thos. S., Box 73, Madison Square P. O., N. Y. City. (Silk & linen.)  
 Conover, The C. E. Co., 101 Franklin St., N. Y. City. "Naiad."  
 International School of Aeronautics, Garden City, L. I., N. Y.  
 Lewis, O. F., Saratoga Springs, N. Y.  
 Myers, Carl E., Balloon Farm, Frankfort, N. Y.

## HYDROGEN GAS GENERATORS

Lewis, O. F., Saratoga Springs, N. Y.  
 Myers, Carl E., Balloon Farm, Frankfort, N. Y.

## FRAMES, for Dirigibles

Hamilton, Thos. F., 298 30th Ave., Seattle, Wash.  
 Kaiser, E., 42 Broadway, N. Y. City. (Imported.)

## INSTRUCTION, Aeronautic

International School of Aeronautics, Garden City, L. I., N. Y. (Aviation, dirigible & aerostat courses.)  
 Oriental University, Route 4, Washington, D. C.  
 Robertson Aerial Co., The, Betz Bldg., Philadelphia, Pa. "Robertson."

## FRAME PARTS, Aeroplane

Aero Supply Co., The, Cynwyd, Pa. "Aero."  
 Wittmann, C. & A., 17 & 19 Ocean Terrace, Staten Island, N. Y. "Wittmann Standard." (Spruce main-beams, struts, ribs, etc.)

## INSTRUMENTS, Aerial

DuVivier, Ernest H., N. Y. City. (Anemometers, hygrometers, altitude barometers, traction dynamometers & statoscopes.)  
 International School of Aeronautics, Garden City, L. I., N. Y. "Hue" (French).  
 ★ Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis. "Warner Aero-Meter," (Anemometer.)

## GAS VALVES

Kaiser, E., 42 Broadway, N. Y. City. (Imported.)

## INSURANCE, Aerial

Sears, E. H., 31a Harvard St., Brookline, Mass.

## GLIDERS

Ashburnham Aviation Co., Ashburnham, Mass.  
 Burgess, W. Starling Co., Ltd., Marblehead, Mass.  
 Burlingame, Elmer, 928 Oliver Bldg., Boston, Mass. "Burlingame."  
 Hamilton, Thos. F., 298 30th Ave., Seattle, Wash. "Hamilton."  
 Schneider, F. P., 1920 East 178th St., N. Y. City.  
 Tecl Mfg. Co., Medford, Mass.  
 Wilson, A. V., Bar Harbor, Me.  
 Wittmann, C. & A., 17 & 19 Ocean Terrace, Staten Island, N. Y. "Wittmann Standard." (Biplane.)

## LAMPS, Aeroplane

★ Badger Brass Mfg. Co., Kenosha, Wis. (Searchlights.)  
 Indiana Lamp Co., Connersville, Ind. (Oil, electric & acetylene.)  
 Kaiser, E., 42 Broadway, N. Y. City. (Aluminum, imported.)

## HUBS, Aeroplane

Eclipse Machine Co., Elmira, N. Y. "Eclipse."

## LUMBER, For Aeroplanes

Aero Supply Co., The, Cynwyd, Pa. "Aero." (Milled.)

**MOTORS, Aeronautic**

- Adams Co., Kenosha, Wis.  
 Aero-Motion Co., The, St. Louis, Mo.  
 'Gnome'. (French.)  
 Bates, Carl, 104 W. Oak St., Chicago, Ill.  
 Buffum, H. H., The Weirs, N. H.  
 Burgess, W. Starling Co., Ltd., Marblehead, Mass.  
 Continental Engine Co., 8-10 S. Canal St., Chicago, Ill. "Harroun."  
 De Dion Bouton Selling Branch, 1647 Broadway, N. Y. City. (Imported.)  
 ★Duryea, Chas. E., Reading, Pa. "Duryea."  
 Easton Cordage Co., Easton, Pa.  
 Elbridge Engine Co., Culver Road, Rochester, N. Y. "Featherweight."  
 Greene Co., The, 1777 Broadway, N. Y. City.  
 Hansen & Snow, 540 S. Lake Ave., Pasadena, Cal.  
 Harriman Motor Works, The, South Glastonbury, Conn. "HF."  
 Herring-Curtiss Co., The, Hammondsport, N. Y. "Curtiss."  
 Hettinger Engine Co., Bridgeton, N. J.  
 Kasmar, M. K., 1827 N. Paulina St., Chicago, Ill.  
 Kowalsky, Jno. Motor Works, Verona, Pa.  
 L. A. W. Motors Co., Inc., Providence, R. I.  
 Requa-Gibson Co., The, 225 W. 49th St., N. Y. City.  
 Rudolph, Wm. F., Broad & Wallace Sts., Phila., Pa. (Two and four cycle.)  
 Scientific Aeroplane & Airship Co., Box 773, N. Y. City.  
 Schneider, F. P., 1020 E. 178th St., N. Y. City.  
 Slater, Wm. E., 2126 Hayes St., San Francisco, Cal. (Small motors for aeroplane models.)  
 Stenzy, A. F. P., 1019 Binney St., Baltimore, Md. "Stenzy's."  
 Terry Engine Co., Bay, 43rd & 44th Sts., Ulmer Park, Brooklyn, N. Y. "Terry."

**NETTING**

Lewis, O. F., Saratoga Springs, N. Y.

**OIL**

Indian Refining Co., Inc., Cincinnati, Ohio.  
 "Aeroline."

**PARACHUTES**

Hamilton, Thos. F., 208 30th Ave., Seattle, Wash. "Sylvan."

**PROPELLERS, Aeroplane**

- Aero-Motion Co., The, St. Louis, Mo. "L. Chauviere." (French.)  
 Aero Supply Co., The, Cynwyd, Pa. "Aero."  
 Bates, Carl, 104 W. Oak St., Chicago, Ill.  
 Burlingame, Elmer, 928 Oliver Bldg., Boston, Mass. "Burlingame."  
 Easton Cordage Co., Easton, Pa. (To order.)  
 Greene Co., The, 1777 Broadway, N. Y. City.  
 Harriman Motor Works, The, South Glastonbury, Conn. "HF."  
 International School of Aeronautics, Garden City, L. I., N. Y. "Chauviere." (French.)  
 Moller, J. A., New Rochelle, N. Y.  
 Requa-Gibson Co., The, 225 W. 49th St., N. Y. City. (Laminated wood.)  
 Scientific Aeroplane & Airship Co., Box 773, N. Y. City.  
 Schneider, F. P., 1020 E. 178th St., N. Y. City.

**PUBLICATIONS, Aeronautic**

Kasmar, M. K., 1827 N. Paulina St., Chicago, Ill.

**RADIATORS, Aeroplane**

Kaiser, E., 42 Broadway, N. Y. City. "Kaiser." (Aluminum, imported.)

**SHOCK ABSORBERS**

(For Aeroplanes.)

★Kilgore Mfg. Co., 585 Boylston St., Boston, Mass.

**SOARING BLADES**

Dressler, R., Coney Island, N. Y.

**STEERING GEARS, Aeroplane**

Aero Supply Co., The, Cynwyd, Pa. "Aero."

**TANKS, Aeroplane**

Kaiser, E., 42 Broadway, N. Y. City. (Aluminum, gasoline, oil & water, imported.)

**TIRES, for Aeroplanes**

Hartford Rubber Works Co., Hartford, Conn.

**TRIPLANE TOWING MACHINES**

Hamilton, Thos. F., 208 30th Ave., Seattle, Wash. "Hamilton."

**TURN-BUCKLES & EYE-BOLTS**

Wittmann, C. & A., 17 & 19 Ocean Terrace, Staten Island, N. Y. "Wittmann Standard."

**VARNISH (For aero cloth)**

Hartford Rubber Works Co., Hartford, Conn.  
 Lewis, O. F., Saratoga Springs, N. Y.  
 Wrinkle Paint Mfg. Co., Columbus, Ohio.  
 "Wrinkle's."

**WOODWORK, Aeroplane**

American Veneer Co., 100 Market St., Kenilworth, N. J.

★ indicates Advertisers—see Index in back of book.

# ACCESSORIES AND PARTS

## ACCESSORIES, Miscellaneous, Motor Boat

Atlantic Co., The, Amesbury, Mass.  
 Champaign Bros., Ithaca, N. Y.  
 Ferro Machine & Foundry Co., The, 115 Wade Building, Cleveland, Ohio.  
 Horton Boat, Engine & Supply Co., 90 South Ave., Rochester, N. Y.  
 La Buire Import Co., 123 W. 68th St., N. Y. City. "La Buire." (Imported.)  
 Lackawanna Mfg. Co., Newburgh, N. Y.  
 North Chicago Machine Co., The, North Chicago, Ill.  
 Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City. (Ventilators.)  
 Turner Brass Works, The, Sycamore, Ill. (Chucks, cleats and brass railing.)  
 Wilcox, Crittenden & Co., Inc., Middletown, Conn.

## ACCESSORIES, Miscellaneous, Motor Cycle

Baker, F. A., & Co., 37 Warren St., N. Y. City.  
 Capitol Specialty Works, 147 Hudson Ave., Albany, N. Y. (Spoke and tire protectors.)  
 ★Greyhound Motor Works, 1443 Niagara St., Buffalo, N. Y.  
 ★Motorcycle Equipment Co., Hammondsport, N. Y. "Erie."  
 Motorcycle Specialty Co., The, 258 Columbus Ave., Boston, Mass. (Chain and idler guides.)  
 Mueller, L. J., 6417 Woodland Ave., S. E., Cleveland, Ohio. "Mueller" (pedal repair pins.)  
 ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "N. S. U."  
 Prospect Motor Co., 1900 Broadway, N. Y. City. "Simplex" (handle bar switches, cable clips, etc.)  
 Strauss, Jos. & Son, 215-17 Genesee St., Buffalo, N. Y.  
 Swenson, B. A., 298 Blackstone St., Cor. Prairie Ave., Providence, R. I. ("Swenson" oil pump and tank and "Swenson" exhaust key remover.)  
 Widmayer, F. B. Co., 2312 Broadway, N. Y. City.

## ACETYLENE GAS TANKS

Air-Tight Steel Tank Co., 421 Wood St., Pittsburgh, Pa. (Not filled.)  
 Compressed Gas Tank Co., The, Canton, Mass. "Victor."  
 Marion Acetylene Specialty Co., The, 162 Broadway, Marion, N. J. "Eclipse."  
 Mayer, Charles W. Co., 10 Furnace St., Rochester, N. Y.

Meteor Tank Co., Middle Haddam, Conn.  
 Nortmann-Duffke Foundry Co., Layton Ave., 26th to 27th, Milwaukee, Wis. (Pressed steel.)  
 ★Prest-O-Lite Co., The, 229-237 E. South St., Indianapolis, Ind. "Prest-O-Lite."  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.  
 Searchlight Gas Co., The, Pittsburg, Pa. "Searchlight."

## ACETYLENE GAS GENERATORS

American Acetylene Stove Co., 504 Masonic Temple, Minneapolis, Minn. (Marine.)  
 B. & L. Auto Lamp Co., 507-509 W. 35th St., N. Y. City.  
 ★Badger Brass Mfg. Co., Kenosha, Wis. "Solar."  
 Brown, The J. W. Mfg. Co., Columbus, Ohio.  
 Castle Lamp Co., The, Toledo, Ohio. "Atwood."  
 Chicago Auto Lamp Works, 71-75 West Jackson Blvd., Chicago, Ill. "Diamond." (Auto and motor cycle.)  
 Corcoran Bros. Co., 712 Reading Road, Cincinnati, Ohio.  
 ★Dietz, R. E. Co., 60 Laight St., N. Y. City. "Handy."  
 Eco Mfg. Co., 53 State St., Boston, Mass. "Elliott." (Storage.)  
 ★Edmunds & Jones Mfg. Co., 313-15 Riopelle St., Detroit, Mich. "E. & J."  
 English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.  
 Gem Brass & Mfg. Co., 119-121 E. Walnut St., Des Moines, Iowa. "Gem."  
 Gray & Davis, Amesbury, Mass.  
 Hall, C. M. Lamp Co., Detroit, Mich.  
 Hauck-Seebach Co., 291-295 Essex St., Brooklyn, N. Y.  
 Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Columbia."  
 Hofacker, G., 553-55 W. 42d St., N. Y. City.  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."  
 Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City. "Phoebus."  
 Motorcar Equipment Co., The, 55 Warren St., N. Y. City. (Motorcycle.)  
 ★New York Auto Lamp Co., 68 Clarkson St., N. Y. City.  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."  
 Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.  
 ★Rose Mfg. Co., 911 Arch St., Philadelphia, Pa. "Neverout."  
 ★Rushmore Dynamo Works, 629 South Ave., Plainfield, N. J. "Rushmore."  
 Saxon Lamp Co., Inc., 530 W. 28th St., N. Y. City.  
 Scoville & Peck Co., 15 Wooster St., New Haven, Conn.  
 Sprague-Waldo Mfg. Co., 18 Piquette Ave., E. Detroit, Mich.  
 Sterling Machine & Stamping Co., Wellington, Ohio. "SMSCO."  
 Victor Lamp Co., The, 1249 Plum St., Cincinnati, Ohio.  
 20th Century Lamp Co., 19 Warren St., N. Y. City. "20th Century." (Motorcycle.)  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Elliott Pat."

★ indicates Advertisers—see Index in back of book.

## ACETYLENE LAMP BURNERS

(See Burners, Acetylene Lamp.)

## ACETYLENE PURIFIERS

Ashton, W. E. & Dorr Co., 2011 Walnut St., Phila., Pa. "Ashton."

## ACID, Battery

(See Battery Acid.)

## AIR COUPLINGS

(See Hose Couplings & Pipe Fittings.)

## AIR FILTERS

Garlock Auto Specialty Co., Palmyra, N. Y. "Whiting Airburetor-Filter."

## ALCOHOL

Gray, Wm. S. & Co., 76 William St., N. Y. City. (Denatured & wood.)  
 Petroleum Products Co., 3600 Grand Blvd., Pittsburg, Pa.  
 Smith, Kline & French Co., 429 Arch St., Phila. Pa. (Denatured & wood.)  
 U. S. Industrial Alcohol Co., 100 William St., N. Y. City. "Pyro." (Denatured.)  
 Webb, James A. & Son, 50-52 Stone St., N. Y. City. (Denatured.)  
 Woolner Distilling Co., Peoria, Ill. "Liberty." (Denatured.)

## ALUMINUM ALLOY

Columbia Smelting & Refining Works, 365 West St., N. Y. City.  
 Kaiser, E., 42 Broadway, N. Y. City.  
 Machol, Morris R., 81 New St., N. Y. City. "Magnalium." (Ingots, sheets, rod, wire & tubing, imported.)

## ALUMINUM CASTINGS

(See Castings, Aluminum.)

## ALUMINUM SHEETS, RODS & INGOTS

Aluminum Co. of America, Pittsburg, Pa. (Ingots aluminum.)  
 Osborn, The J. M. & L. A. Co., Cleveland, O. (Aluminum coated steel sheets.)  
 Stark Rolling Mill Co., Canton, O. "Aluma-loyd" (aluminum alloyed sheets.)  
 Syracuse Smelting Works, New York, N. Y. (Ingots aluminum.)

## ALUMINUM SOLDER

Cleveland Block Co., The, 1173 W. 11th St., Cleveland, Ohio. "Braze Weld."  
 ★Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.  
 Eberhard, C. F., 25 Helen St., Buffalo, N. Y. "Eberhard."  
 Empire Metal Co., Syracuse, N. Y.  
 Hartmann Co., The, 134 W. 49th St., N. Y. City. "Hartmann."  
 International Solder Co., The Syracuse, N. Y. "International."  
 ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. "Richards."  
 Lester Co., The, Fayetteville, N. Y. "Arrow."  
 Millett Brass Co., Highland Station, Springfield, Mass.  
 Reinhold NoFlux Aluminum Solder Co., 50 Demarest St., Newark, N. J. "NoFlux."  
 Thwing, C. B., Philadelphia, Pa.  
 U. S. Reduction Co., Chicago, Ill. "W. F."  
 Wildes, Thomas Sons, 21 Maiden Lane, N. Y. City. "Semper Idem."

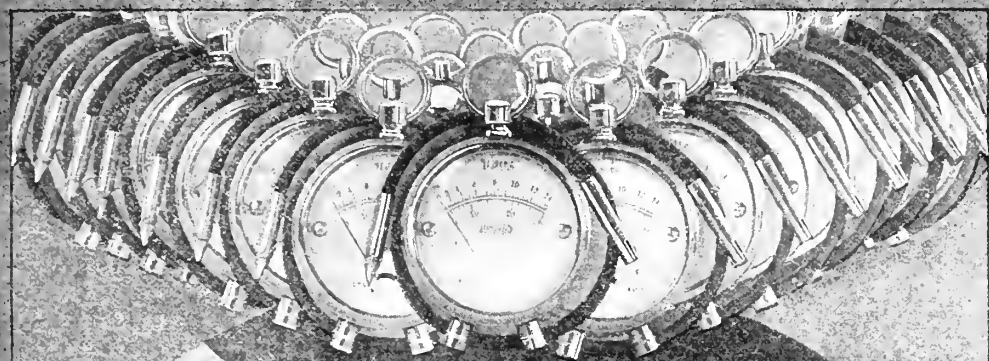
## AMMETERS, Switchboard type

(See Shop Equipment Section.)

## AMMETERS, Pocket

American Coil Co., Foxboro, Mass. "American."  
 American Ever Ready Co., 304-322 Hudson St., N. Y. City. "Eveready."  
 ★Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa. "Kent."  
 Clark Electric Meter Co., 141-43 S. Clinton St., Chicago, Ill.  
 Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."  
 Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."  
 Eldredge Electric Mfg. Co., 3 Park Square, Springfield, Mass. "Eclipse."  
 Excel Instrument Co., 1555 E. 65th St., Cleveland, Ohio. "Excel."  
 Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I.  
 Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Hine-Watt."  
 ★Hoyt Electrical Instrument Works, Penacook, N. H. "Hoyt."  
 International Electric Meter Co., 330 W. Randolph St., Chicago, Ill.

★ indicates Advertisers—see Index in back of book.



# HOYT

## ECLIPSED

**By the HOYT METER = All Others!**

**THE HOYT METERS** absolutely eliminate all guesswork, and represent positively the highest development in this item of motor car equipment.

Simple, durable, indisputably accurate, and thoroughly dependable at all times.

**HOYT METERS** have successfully stood the severest tests and are now adopted and endorsed by leading manufacturers. The thousands in daily use are giving unqualified satisfaction, and bear out the truth of every claim we make for them.

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How about it? Do you want to get in line with an agency for instruments of this class, which have proven such a decided success? Inspection of the **HOYT METERS** will prove their points of superiority, and will convince you that we really are in a class by ourselves, and offer positively the most meritorious and dependable line of **Volt and Ammeters** to be obtained anywhere.

Don't be misled,—insist on our trade-mark **Ampères Volts.**

It will certainly put you on the right path to **Volt and Ammeter Perfection.**

LET US FIGURE WITH YOU

**HOYT ELECTRICAL INSTRUMENT WORKS**  
**PENACOOK, N. H.**

SALES OFFICES:

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New York, 136 Liberty St.

Chicago, 80 Michigan Ave.

**AMMETERS, Pocket—Continued**

- Manhattan Electrical Supply Co., 17 Park Place, N. Y. City. "Elite."  
 Miller, Chas. E., 97-101 Reade St., N. Y. City. "Diamond M."  
 Motor Car Equipment Co., The, 55 Warren St., N. Y. City. (Imported.)  
 National Carbon Co., Lock Drawer L, Cleveland, O. "Columbia."  
 ★Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss."  
 Pignolet, L. M., 78 Cortlandt St., N. Y. City.  
 Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. "Accuro" & "Reliance."  
 Read-Rite Meter Works, 14 Main St., Bluffton, O. "Read-Rite."  
 Reliance Instrument Co., 527 W. Van Buren St., Chicago, Ill. "Reliance."  
 Robert Instrument Co., The, 56 Shelby St., Detroit, Mich. "Robert."  
 Roller-Smith Co., 203 Broadway, N. Y. City. "Roller-Smith."  
 Smith, C. J. & Co., St. Paul, Minn. "Cisco."  
 Stackpole Battery Co., St. Marys, Pa.  
 Sterling Mfg. Co., The, 416 American Trust Bldg., Cleveland, O.  
 ★Union Battery Co., Belleville, N. J. "Union."  
 Wagner Electric Manufacturing Co., 6400 Plymouth Ave., St. Louis, Mo.  
 Westchester Appliance Co., 13 to 15 Canal Place, Bronx, New York.

**ANCHORS**

- Bleecker, Augustus & Sons, 44 South St., N. Y. City.  
 Camden Anchor-Rockland Machine Co., Camden, Me.  
 Laughlin, The Thos. Co., 143 Fore St., Portland, Me.  
 Morss, A. S. Co., 210-212 Commercial St., Boston, Mass. "Morss."

**ANNUNCIATORS**

- Bridgeport Coach Lace Co., 805 Wood Ave., Bridgeport, Conn. (Speaking tubes.)  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. ("Madison Square" & "Mechanics Hall" annunciators; also speaking tubes.)  
 Holt & Beebe, 40 Sudbury St., Boston, Mass.  
 Horstmann, Wm. H. Co., 5th & Cherry Sts., Phila., Pa. (Speaking tubes.)  
 Jones Speedometer, The, Broadway & 76th St., N. Y. City. "Jones."  
 Motor Car Equipment Co., The, 55 Warren St., N. Y. City. (And speaking tubes.)  
 Parry, A. N. & Co., Amesbury, Mass. (Speaking tubes.)  
 Perpete Mfg. Co., State & Wall Sts., New Haven, Conn. (Speaking tubes.)  
 Schlegel Mfg. Co., 27 Canal St., Rochester, N. Y. (Speaking tubes.)  
 Strong, M. H., 168 South Ave., Rochester, N. Y. (Speaking tubes.)  
 Ten Eick, Cornelius, 253 W. 47th St., N. Y. City. (Speaking tubes.)  
 Western Electric Co., The, 465 West St., New York, N. Y. "Hawthorne."

**ANTI-FREEZING SOLUTIONS**

- Ajax Auto Co., 832-34 E. 34th St., Chicago, Ill. "Ajax."  
 Auto Shop Co., The, Cleveland, O. "No-Mor-Auto-Freeze."  
 ★Baum's Castorine Co., Rome, N. Y. "Baum's."  
 Beringer, George M., Camden, N. J. "Berlinger."  
 Binns Chemical Works, 164 Front St., N. Y. City. (Tri-sodium phosphate.)  
 Gerdelman, Benjamin Mfg. Co., 4630 Olive St., St. Louis, Mo. "Polar Wave."  
 Globe Soap Co., Cincinnati, Ohio. "Blizzard."  
 Grasselli Chemical Co., Cincinnati, Ohio. "Auto-Not-Freeze."  
 Hazen-Brown Co., 100 South St., Boston, Mass. "Cook-Perary."  
 Imperial Polish Co., The, 208 W. Kinzie St., Chicago, Ill. "Imperial."  
 Kalbfleisch, Franklin H. Co., Metropolis Bldg., N. Y. City.  
 Kielgass-Lehman Co., 208 W. Kinzie St., Chicago, Ill. "Imperial."  
 Miller, Chas. E., 97-101 Reade St., N. Y. City.  
 Northwestern Chemical Co., Marietta, Ohio. "Thermite."  
 Peterson, T. J. Co., Security Bldg., Chicago, Ill. "Solvolute."  
 Smith, Kline & French Co., 429 Arch St., Phila., Pa. (Calcium chloride.)  
 U. S. Industrial Alcohol Co., 100 William St., N. Y. City.  
 Woolner & Co., Peoria, Ill.  
 Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J.

**ANTI-FRICTION METAL**

(See Bearing Metal.)

**ANTI-SKID DEVICES**

(See also Tire Protectors.)

- Auto Chain Repair Co., The, 1428 Wabash Ave., Chicago, Ill. "Reliable." (Anti-skid chains and parts.)  
 Automobile Metal Specialty Co., 4430 Market St., Phila., Pa. "Avil."  
 Bailey, C. J. & Co., 22 Boylston St., Boston, Mass. "Won't Slip" Bands.  
 Baldwin & Overholt, Galesburg, Ill. "B & O Line."  
 Baum's Brass & Model Works, 244 Third Ave., S. Minneapolis, Minn. "Perfection."  
 Brockett & Gorham, Marion, Ohio. "Bro-Gor." (Chains.)  
 Brown, J. C. Mfg. & Garage Co., Butler, Ind. "Brown." (Chains.)  
 Caldwell, E. P. Co., 219 E. Fourth St., Waterloo, Ia. "Caldwell's."  
 Canne, H. L., Milford, Pa. "Canne." (Steel belt.)  
 Cassady-Fairbank Mfg. Co., The, 6106-30 La Salle St., Chicago, Ill. "Elliott Process" cross chains, "Lightning" cross chain hooks and "Fulerum" side chain connectors.  
 Chandler Co., 561 West 36th St., N. Y. City.  
 Cleveland Chain & Mfg. Co., Cleveland, Ohio. "Wear-Well." (Chains.)  
 Courtney Rubber Co., 1976 Broadway, N. Y. City. "Courtney."  
 Davis Robe Co., The, Inc., 126 S. State St., Chicago, Ill. (Chains.)

# HELICAL GEARS

are most desirable for motor  
timing for one big reason:

They are far quieter in action than any gears cut with either spur or bevel teeth (even though made of rawhide or fibre) can possibly be made to be.

This fact is becoming better known each day.

If you do not know it as yet, let us help you to investigate.

That it is worthy of your investigation is well instanced by the fact that we are not cutting **Helical Timing Gears** for twenty-six of the best known, largest, oldest, and most successful of the American motor car manufacturers. Our present orders for gears for 1911 cars aggregate over **250,000 Helical Gears**.

Our shop capacity is such that we can take care of your requirements also, both in quality and in early deliveries.

*Write to us.*

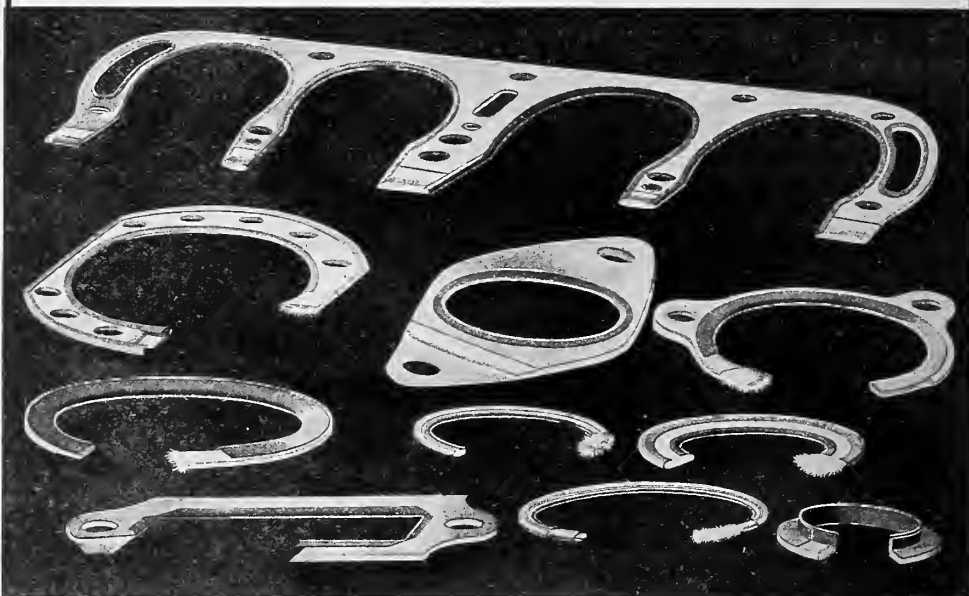
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**THE GRANT-LEES MACHINE COMPANY**  
**CLEVELAND, OHIO**



# McKIM Copper Asbestos GASKETS



Have been standard with motor builders since the industry started.

Because they are the only gaskets that insure tight and lasting joints in cylinder heads, inlet and exhaust flanges, valve caps, spark plugs, carburetors, etc.

They are cheaper than ordinary asbestos or packing for they can be used many times.

We can assure you of lowest prices and immediate shipments because we have thousands of dies for all sizes and shapes.

*Remember to Specify the McKIM GASKET*

Made Solely by

## McCord Manufacturing Company

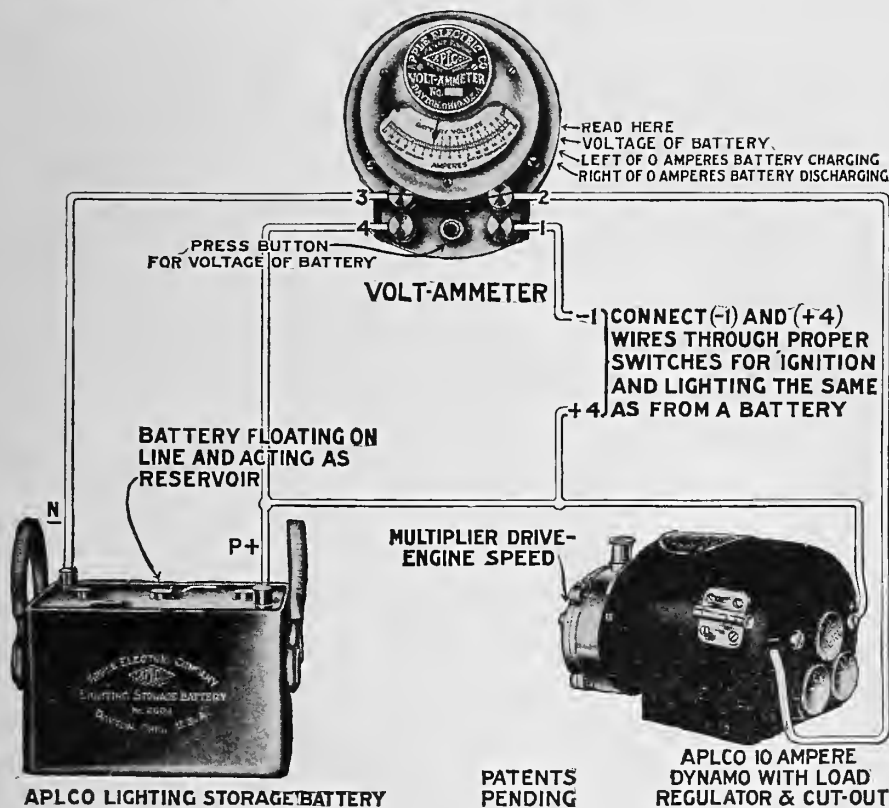
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## "APLCO" ELECTRIC SYSTEM FOR AUTOMOBILES

THE ONE SYSTEM that has made good for more than two years, electric lighting all lights on a number of cars. Several of our users have remarked, "They can see as far at night with 'Aplco' Headlights as in daylight." Our Bulletin No. 16 describes the system fully, and shows applications on a variety of cars.



The "Aplco" Automobile Dynamo is the lightest and most compact dynamo yet built that will make all of the electricity that can be used on an automobile. It is so designed that it can be geared direct to a gasoline automobile engine and go under the car bonnet. This dynamo is the result of more than twelve years' specialization in this line of work.

When writing for printed matter, advise the make and model of your car.

### APPLE ELECTRIC COMPANY

20 North Canal Street

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# Have You \$1250 to Invest?

Then this is for you

## Ask Yourself

# Do You—

Want to buy an automobile?

Demand a car free from flaws and experimental features?

Insist that it be absolutely correct in every mechanical detail?

Desire a car with years of success back of it?

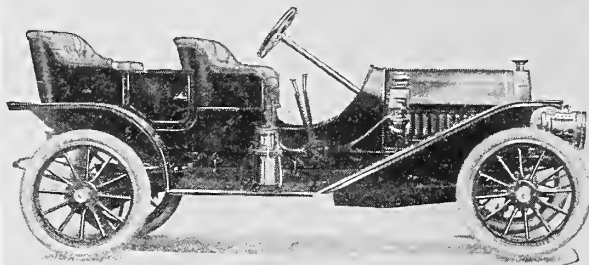
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Want the Greatest Automobile Value in America?

Then write us immediately. We can convince you  
**We Have the Car You Are Looking For**



4-Passenger Baby Tonneau  
\$1250

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**Regal "30"**

"The car that satisfies"

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**Motor Car**  
**Co.**

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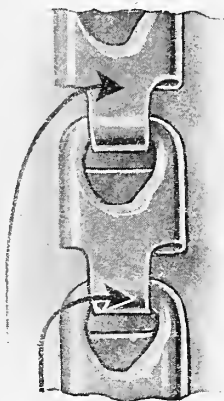
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# FOX

## Anti-Skid Chains

The chain which **DOES**  
absolutely prevent  
skidding

The chain which **CAN'T**  
and **WON'T** cut tires



This is a cross  
link of a Fox  
Anti Skid Chain  
showing the side  
which goes  
against the tire.

1 2

**Fig. 1.**—These flat surfaces come against the tire. They are the only portions of the cross chains which do touch the shoe and that is why they **don't** and **can't** cut the rubber. **Fig. 2.**—This portion of the connecting link curves away from the tire so that no edge can come against the rubber.

The Fox Anti Skid Tire Chain prevents skidding absolutely. It is the only chain which *does*. We stand behind this statement fully—it *will keep your car* from skidding. It will enable you to use your car on days when you would not *dare* take it out otherwise. You are **SAFE**, your car is safe when equipped with Fox Chains no matter what the condition of the roads—safe on slippery, greasy asphalt, on ice and snow-covered macadam, on slimy cobbles, on car tracks—on any road or street.

### THE FOX SAVES TIRE BILLS

In the Fox, no edge, no cutting surface of any kind comes against the tire. Nothing except a broad, flat, perfectly smooth metal surface **without** edges, touches the tire. The broad flat links fit the shoe as harmlessly and as closely as a piece of tire tape. If you should swing a heavy sledge hammer against the links of the Fox Cross Chain, not once, but **many times**, you **could not make** it cut into the tires. If you should do this with other chains, you would quickly drive the links **into** the rubber and **cut a great hole** perhaps with the very first blow.

Send for Free Booklet

## FOX METALLIC TIRE BELT CO

1999 Broadway - - New York City

### ANTI-SKID DEVICES—Continued

- Diamond Pulvs Co., 1331 Intervale Ave., N. Y. City. "Chandler." (Chains.)
- Downing, Chas. J., 1777 Broadway, N. Y. City. "Downing." (Chains.)
- Enterprise Chain Co., Trenton, N. J. "Morgan." (Chains.)
- Ford Repair Link Co., 147-150 Ann St., Bridgeport, Conn. "Ford" (Repair links.)
- Foskett & Co., 226-28 La Salle St., Chicago, Ill. (Chains.)
- ★ Fox Metallic Tire Belt Co., 1999 Broadway, N. Y. City. (Chains.)
- Hager, Chas. & Son, 244-46 East 52d St., N. Y. City. (Leather covered chains.)
- Johnson's, Iver, Sporting Goods Co., 155 Washington St., Boston, Mass.
- King Leather Tire Co., 3417-3419 Vliet St., Milwaukee, Wis. "King."
- Leather Tire Goods Co., The, Niagara Falls, N. Y. "Kant-Skids" and "Woodworth" (Chains.)
- ★ Lyon Non-Skid Co., 433 N. Broad St., Phila., Pa.
- Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radium." (Chains.)
- Motor Appliances Co., 1438 Michigan Ave., Chicago, Ill. "Zig Zag."
- ★ N. S. U. Motor Co., 206 W. 76th St., N. Y. City. (For motorcycles.)
- Newhall Chain Forge & Iron Co., 90 West St., N. Y. City. ("Ever-Ready," "Presto" & "Le Vif" cross chains & "Presto" & "Le Vif" hooks.)
- Perfection Non-Skid Climber Co., Edon, Ohio. "Perfection."
- Perry Chain Grip Co., Lansing, Mich. "Perry" (Chains.)
- Pitts Anti-Skid Chain Co., 2422 Michigan Ave., Chicago, Ill. "Pitts." (Chains.)
- Ruff Spring Tire Chain Co., 74 Cortlandt St., N. Y. City. "Ruff." (Anti-skid chains & chain grips.)
- Queen Mfg. Co., Webster City, Iowa. "Burnells."
- Raymond & Co., 331 Michigan Ave., Chicago, Ill. "Raymond." (Clip non-skid chains.)
- Special Motor Vehicle Co., The, 8th & Broadway, Cincinnati, Ohio.
- Standard Traction Tread Co., 399 Boylston St., Boston, Mass. "Standard." (Chains.)
- Steering Wheel Co., The, Sidney, O. "Henry."
- Traver, Philip C. Mfg. Co., Far Rockaway, N. Y. "Traver." (Chains.)
- Union Elevator & Machine Co., 215-17 W. Ontario St., Chicago, Ill. "Union." (Chains.)
- Victor Tire Traction Co., 16 State St., Boston, Mass. "Victor." (Chains.)
- Walker Auto Tire Band Co., 18-24 S. East St., Indianapolis, Ind. "Walker."
- Weed Chain Tire Grip Co., 28 Moore St., N. Y. City. "Weed."
- Whittaker Chain Tread Co., 12 Pearl St., Boston, Mass. "Whittaker."
- Williams, C. L., 312 Halsey St., Newark, N. J. (Chains.)

### ANTI-SKID RIVETS

(See Rivets.)

### ASBESTOS, Sheet

(See Raw Material.)



# Woodworth

## WOODWORTH TREADS

Made of chrome leather—studded with steel rivets.

### DO NOT CHAFE OR HEAT THE TIRE

Woodworth Treads are the only true tire protectors. They never chafe or heat the tires. They prevent punctures and skidding. They are held in place by coil springs along the sides, which automatically take up all slack and prevent any looseness. The protector is always tight and smooth, so that it cannot chafe the tire.

They fit all makes of tires—anyone can easily put them on.

Woodworth Tire Chains are made in the regular side-chain style and in single chains, which can be strapped to the spokes. Each cross piece has a strap of heavy chrome leather under it, protecting the tire from wear or injury by the metal.

*Send for our 1910 catalog showing the treads, chains and other devices that save tires and prevent skidding.*

### LEATHER TIRE GOODS CO.

NIAGARA FALLS, N. Y.



**AUTOGENOUS WELDING**

(See Welding.)

**AUTOMOBILE COVERS**

(See Covers, Automobile.)

**AUTOMOBILE PARTS, Miscellaneous**

- (See also Buggy Type Automobile Parts.)  
 Aetna Brass Mfg. Co., The 4800-4810 Hamilton Ave., Cleveland, Ohio.  
 Ashley Machine Works, 714 University Ave., Rochester, N. Y. (Steel.)  
 ★Atlas Stamping Co., 557-61 Jackson Blvd., Chicago, Ill. (To order.)  
 Auto Parts Mfg. Co., South Elliot St. & T. E. W. R., Muncie, Ind. "B. T. K."  
 Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.  
 Auto & Power Appliance Co., The, 357-359 The Arcade, Cleveland, Ohio.  
 Auto Trading & Repair Co., 1515 Prospect Ave., Cleveland, Ohio. "Auto T. & R. Co." (Repair parts for White Steam Cars.)  
 Blair Tool & Machine Works, 24-27 West St., N. Y. City. (Special.)  
 ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.  
 Boston Pressed Metal Co., 171-73 Union St., Worcester, Mass. (Pressed metal to order.)  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y. (Dust shields for brake drums.)  
 Delahaye Import Co., 2 Rector St., N. Y. City. (Imported.)  
 Detroit Metal Parts Co., Detroit, Mich.  
 Detroit Screw Works, Detroit, Mich. (Cups, nuts, cones, coupling bolts, axles, bearings, turnbuckles, spark plugs, hardened and ground parts.)  
 ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. (On contract.)  
 ★Diamond Rubber Co., Akron, Ohio. "Diamond." (Hard rubber.)  
 Dolson Auto Supply Co., Muncie, Ind. (For Dolson cars.)  
 Electric Welding Products Co., The, Cleveland, Ohio. (Carbon and nickel steel parts.)  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, Ohio.  
 Fiat Automobile Co., 1786 Broadway, N. Y. City. "Fiat." (Imported.)  
 Fowler Brass Works, Inc., The, 2333-35 Wabash Ave., Chicago, Ill. (Finished.)  
 Geier, The P. A. Co., 5112 St. Clair Ave., Cleveland, Ohio. (To order.)  
 ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, Ohio. (To order.)  
 Hol-Tan Co., The, 1741 Broadway, N. Y. City. "F. I. A. T." (Spare parts, imported.)  
 Hotchkiss Import Co., 20 W. 60th St., N. Y. City. "Hotchkiss." (Imported.)  
 Krupp (Prosser & Son), P. O. Box 878, G. P. O., N. Y. City.  
 Lewis Electrical Welding & Mfg. Co., 234 Cherry St., Toledo, Ohio.  
 Morrow Mfg. Co., Elmira, N. Y. (To order.)  
 National Cycle Mfg. Co., Bay City, Mich. (To order.)  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 ★Niagara Machine Co., 825-27 Linwood Ave., Niagara Falls, N. Y. (To order.)

- Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. (To order.)  
 ★Ohio Brass Co., Mansfield, Ohio. (To order.)  
 ★Ohio Metal Products Co., Dayton, Ohio. (To order.)  
 Panhard & Levassor, Broadway & 62d St., N. Y. City. (Spare parts for Panhard chassis.)  
 Sanford, F. C. Mfg. Co., Bridgeport, Conn.  
 Sibley-Houfley Machine Co., The, 180 Brush St., Detroit, Mich.  
 Tube Bending Machine Co., 148-150 Mulberry St., Newark, N. J.  
 Universal Machinery Co., 1916 St. Paul Ave., Milwaukee, Wis.  
 Victor Iron Works, 523 Schofield Bldg., Cleveland, Ohio. (To order.)  
 Wade Machine Co., 287 Atlantic Ave., Boston, Mass.  
 Western Automatic Machine Screw Co., Elyria, Ohio.

**AUTOMOBILE PARTS, Buggy Type**

- Auto Parts Mfg. Co., South Elliot St. & T. E. W. R., Muncie, Ind. "B. T. K."  
 Muncie Gear Works, Muncie, Ind. "Muncie."  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 ★Ohio Brass Co., Mansfield, Ohio. (To order.)

**AXLES, Front & Rear**

- American Ball Bearing Co., Edgewater Park & L. S. & M. S. Ry., Cleveland, Ohio.  
 ★American Die & Tool Co., Reading, Pa. (Rear.)  
 American Gear & Mfg. Co., Jackson, Mich.  
 Automatic Axle Co., Lancaster, Pa.  
 ★Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich. "Autoart." (Rear.)  
 Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.  
 Barnett Drop Forging Co., East Hampton, Mass.  
 Bates Forge Co., The, Indianapolis, Ind. (Front.)  
 Bethlehem Steel Co., South Bethlehem, Pa.  
 ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.  
 Chicago Recording Scale Co., Waukegan, Ill. "Graham."  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel to order.)  
 Cleveland Axle Mfg. Co., Canton, Ohio. "Arrow."  
 Continental Engine Co., Chicago, Ill. (For light cars.)  
 Covert Motor Vehicle Co., Lockport, N. Y. "Covert."  
 ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 Deschler, August, 18-20 E. Water St., Chillicothe, Ohio.  
 ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. "Diamond."  
 Driggs-Seabury Ordnance Corp., Sharon, Pa.  
 ★Dunlap Engineering Co., The, Columbus, Ohio.  
 Elyria Machine Parts Co., Elyria, Ohio. (For electrics.)  
 Funk Engineering Co., 39-47 Fourteenth St., Hoboken, N. J.  
 ★Gill, P. H. & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.  
 Gunderson-Walter Co., The, 182-94 Bellevue Ave., Detroit, Mich. (Rear.)

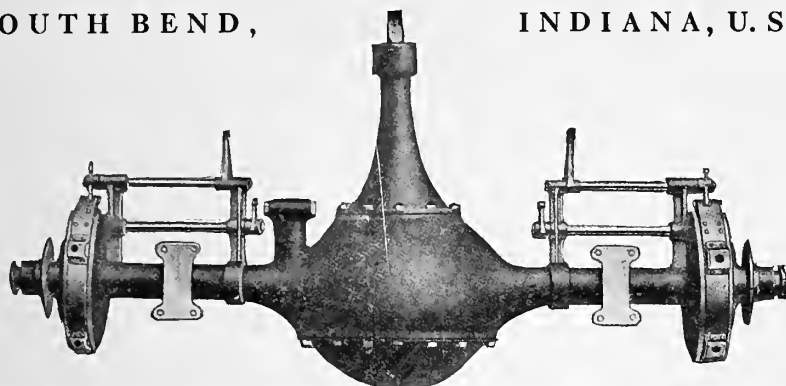


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of America

SOUTH BEND,

INDIANA, U. S. A.



Here is an Axle that for **Simplicity, Design, Strength** and **Price** has no equal in America.

**Housing** one piece of imported steel with the rear plate removable for extracting the differential and the inspection of the bearings without disturbing the entire axle.

**The Design** of the **One-Piece Steel Housing** is very neat and **strong**, unlike **other Axles** that are made from a number of malleable castings, that sag and throw gears out of alignment after in use a couple of months.

Yet your axles cost no more than the cheaply constructed axles that are on the market today.

# The Dunlap Engineering Company

COLUMBUS, OHIO

Manufacturers of Gasoline and Electric

## AUTOMOBILE AXLES

Axles made from our own design or according to your specifications

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CYCLE AND

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is \$2.00 a year.

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"Hess."
- Hess-Pontiac Spring & Axle Co., Pontiac, Mich.
- Higgins Spring & Axle Co., Racine, Wis.
- International Engineering Co. of N. J., 1779 Broadway, N. Y. City. "Lemoine." (Imported.)
- Krefeld Steel Co., 50 Church St., N. Y. City.
- Krupp (Prosser & Son), Box 878, G. P. O., N. Y. City.
- Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. "M. A. B." (Imported.)
- Lee & Porter Mfg. Co., Buchanan, Mich.
- Lewis Spring & Axle Co., Jackson, Mich.
- ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa. "Liggett."
- ★Long Arm System Co., East 38th St. & Lakeside Ave., Cleveland, Ohio.
- ★McCue Co., Hartford, Conn.
- ★Merchant & Evans Co., 517 Arch St., Phila., Pa.
- Metal Products Co., 226 Abbott St., Detroit, Mich.
- ★Michigan Automobile Co., Ltd., Kalamazoo, Mich.
- Mott Wheel Works, Pleasant St., Utica, N. Y.
- Muncie Gear Works, Muncie, Ind. "Muncie."
- Munsing Mfg. Co., Hoboken, N. J. "Munsing."
- Murray Safety Wheel & Axle Co., The, 442 Atlantic Ave., McKeesport, Pa. "Murray." (Safety wheel and axle.)
- Murray Machine Works, Winchester & Wabansia Aves., Chicago, Ill.
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- ★Niagara Machine Co., 825-27 Linwood Ave., Niagara Falls, N. Y. (To order.)
- Northway Motor & Mfg. Co., Maybury Ave., Detroit, Mich. (Axle and transmission combined.)
- Obenberger Drop Forge Co., 220-224 Lake St., Milwaukee, Wis.
- Parish Mfg. Co., 7th & Chestnut Sts., Reading, Pa.
- Park Drop Forge Co., The, 730 E. 79th St., Cleveland, Ohio.
- Peru Auto Parts Mfg. Co., Peru, Ind.
- Providence Engineering Works, 521 Main St., Providence, R. I.
- Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa. (Auto and cycle.)
- Russel Motor Axle Co., Chene St. & Belt Line, Detroit, Mich.
- Salisbury Wheel & Mfg. Co., Jamestown, N. Y.
- Scranton Axle Works, The, Scranton, Pa. "Scranton."
- Sheldon Axle Co., Wilkes-Barre, Pa. "Sheldon," "Anchor," "Dragon," "Everlasting" and "Ton Don."
- ★Smith, A. O. Co., Park, Clinton and Virginia Sts., Milwaukee, Wis.
- Standard Roller Bearing Co., Cor. 50th St. and Lancaster Ave., Phila., Pa. (Also axle and change speed gear combined.)
- Stutz Auto Parts Co., 10th St. and Canal, Indianapolis, Ind. "Stutz."
- T. C. M. Mfg. Co., The, 46 Lawrence St., Newark, N. J.
- ★Timken-Detroit Axle Co., The, Clark Ave. and Pere Marquette R. R., Detroit, Mich. "Timken."
- ★Tippett Mfg. Co., The, 172-82 W. Locust St., Columbus, Ohio.
- Transue & Williams Co., The, Alliance, Ohio.
- Vanadium Metals Co., Frick Bldg., Pittsburgh, Pa. (Bronze.)
- Wabash Gear Works, Terre Haute, Ind.
- Weaver, George A., Newport, R. I. "Pathfinder." (Front.)
- ★Weston-Mott Co., Flint, Mich. "Weston-Mott."
- ★Yuster Axle & Transmission Co. of America, South Bend, Ind.

**AXLE ENDS**

(See Forgings.)

**AXLE PARTS**

- Bossert Co., The, Utica, N. Y. (Housings to order.)
- Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel rear axle housings to order.)
- ★Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich. "Presteel." (Housings.)
- Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich. (Tubes.)
- Gardner Engine Starter Co., 1451-55 Michigan Ave., Chicago, Ill. "Gardner." (Truss for "Ford" rear axle.)
- Johnston & Jennings Co., 877 Addison Rd., Cleveland, Ohio.
- Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y. (Axle housings.)
- ★National Tube Co., Frick Bldg., Pittsburgh, Pa. "Shelby." (Tubes.)
- Parish Mfg. Co., 7th & Chestnut Sts., Reading, Pa. (Housings.)
- ★Standard Welding Co., The, 76th St., N. W., & L. S. & M. S. R. R., Cleveland, Ohio. (Tubes.)

**BABBITT METAL**

(See Bearing Metal.)

**BALLS**

- American Ball Co., 115 Clifford St., Providence, R. I. (Steel and brass.)
- Auto Machinery Co., Ltd., Coventry, Eng. (Steel, bronze and brass.)
- Boker, Herman & Co., 101 Duane St., New York, N. Y. "High Duty German Steel."
- Bretz, J. S. Co., Times Bldg., N. Y. City. "F. & S." (German steel.)
- Grant-Hoover Ball Co., Merchantville, N. J. "G. H. B. Co." (Steel and brass.)
- Pressed Steel Mfg. Co., 454 The Bourse, Phila., Pa. (Steel and brass.)
- R. I. V. Co., 1771 Broadway, N. Y. City. "Hoffman." (Imported.)
- Standard Roller Bearing Co., 50th & Lancaster Ave., Phila., Pa. "Standard Alloy" and "High Duty." (Steel, brass and bronze.)
- ★Star Ball Retainer Co., The, Lancaster, Pa.
- Victor Tool Co., Waynesboro, Pa. (Steel, brass, bronze and bell metal.)

**BALL BEARINGS, Automobile**

- American Ball Bearing Co., Edgewater Park and L. S. & M. S. Ry., Cleveland, Ohio. "American."
- ★American Ball Co., 115 Clifford St., Providence, R. I.

*You wouldn't attempt to drag a machine into your plant;  
you would reduce labor and friction and roll it in.*

Heavy loads can only be successfully carried on "Anti-Friction" bearings. You can quickly demonstrate this fact for yourself. Try to move any heavy weight without using rollers—note the results.

Apply this to axles for commercial motor trucks and you will instantly see one reason why the majority of successful truck builders prefer

## TIMKEN-DETROIT AXLES FOR COMMERCIAL MOTOR TRUCKS

The Timken Tapered Roller Bearing has been absolutely proven to be the only load-carrying "Anti-Friction" Bearing that can and does successfully meet the strenuous conditions of commercial service.

And the Timken Tapered Roller Bearing is only **one** item in the building of Timken-Detroit Axles for commercial motor trucks; but in its assured perfection it is typical of every detail in the building of Timken-Detroit Axles.

In considering the axle situation, consider this: The history of the commercial car, with its vibration of the motor plant on top of solid tires, putting in a full working day over the worst

streets, is a vastly different history than that of the pleasure car, which works a few hours each day on pneumatic tires, for the most part with only one or two passengers, and over the best streets to be found.

The haulage of commercial loads has been our problem for over ten years. We know the service, we know the sizes, we know where to put the strength. Behind every size and measurement in Timken-Detroit Axles is good, sound engineering sense, plus unequalled experience.

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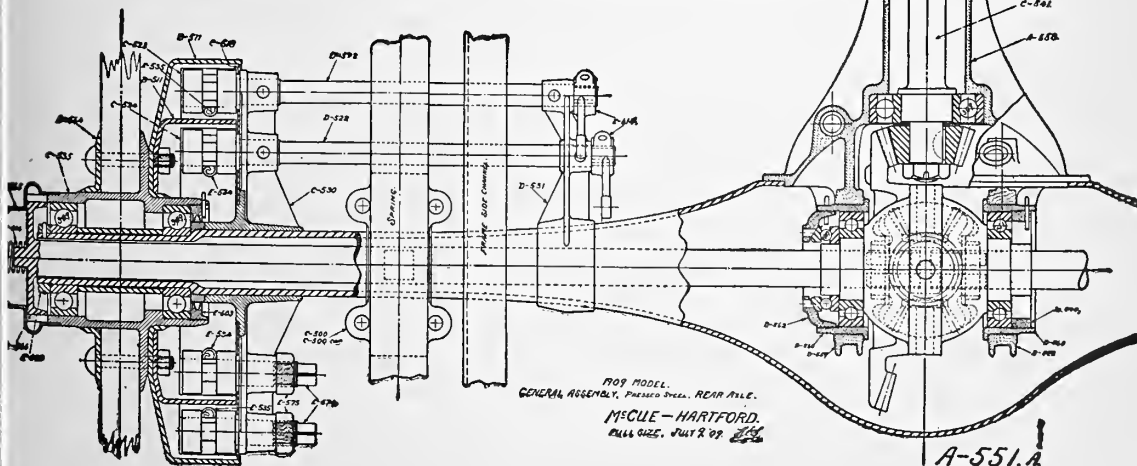
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Floating Type Rear Axle, having steel housing, double expanding brakes, driving shafts, with hub clutches integral, annular ball bearings; I Beam Front Axles with ball bearings in steering head and hubs. . . . .

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- Auburn Ball Bearing Co., 29-35 Elizabeth St., Rochester, N. Y. "Auburn."  
Auto Machinery Co., Ltd., Coventry, Eng.  
Bantam Anti-Friction Co., Bantam, Conn. "Bantam."  
★Barthel, Daly & Miller, 42 Broadway, N. Y. City. "Schafer." (Imported.)  
Bretz, J. S. Co., Times Bldg., N. Y. City. "F. & S." (Annular, imported.)  
Cameron, F. F. Co., Hinsdale, N. H. "Cameron."  
Chapman Ball Bearing Co., 40 Bristol St., Boston, Mass.  
★General Mfg. Co., The, Elkhart, Ind. (Thrust.)  
Gurney Ball Bearing Co., Jamestown, N. Y.  
★Hess-Bright Mfg. Co., The, 2102 Fairmount Ave., Phila. "HB" and "DWF."  
International Engineering Co. of N. J., 1779 Broadway, N. Y. City. "RBF." (Imported.)  
Kneaga Co., The, Inc., Washington, D. C. "Straightline."  
Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. "Norma." (Imported.)  
★Lehman, J. H. Mfg. Co., 500 5th Ave., N. Y. City. "B. K. F." (Imported.)  
Marburg, Theo. H., Room 12, 59 Wall St., N. Y. City. "S. R. O." (Imported.)  
Matthews, The H. A. Mfg. Co., Seymour, Conn.  
★New Departure Mfg. Co., The, Bristol, Conn. "New Departure."  
Pressed Steel Mfg. Co., 454 The Bourse, Phila., Pa. "Knipe."  
R. I. V. Co., 1771 Broadway, N. Y. City. "R. I. V."  
S. P. O. Automobile Co., 1595 Broadway, N. Y. City. "S. P. O." (Imported.)  
★Sparks, Withington Co., Ltd., The, Jackson, Mich.  
Standard Machinery Co., 7 Beverly St., Providence, R. I.  
Standard Roller Bearing Co., 50th and Lancaster Ave., Phila., Pa. "S. R. B."  
★Star Ball Retainer Co., The Lancaster, Pa. (Thrust.)  
Sultemeyer & Co., 50 Church St., N. Y. City. "Rhineland." (Imported.)  
United Bearings Co., Bradford, Pa. "Universal."  
U. S. Ball-Bearing Mfg. Co., 1015 Grand Ave., Chicago, Ill.

**BALL BEARINGS, Cycle**

- ★New Departure Mfg. Co., Bristol, Conn.  
Pressed Steel Mfg. Co., 454 The Bourse, Phila., Pa. "Knipe."

**BALL CONES**

(See Cups and Cones.)

**BALL HANGER BEARINGS**

- Mechanical Devices Co., Inc., Watervliet, N. Y. "Indispensable." (Motor Boat.)

**BALL CUPS**

(See Cups and Cones.)

**BALL RACES**

(See Cups and Cones.)

**BALL & SOCKET JOINTS**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill. (Ball Joints.)  
Birchwood, C. W., 3614 West Harrison Ave., Chicago, Ill. "Birchwood." (For high-wheel cars and motor trucks.)  
Cincinnati Ball Crank Co., 1644-46 Central Ave., Cincinnati, Ohio.  
Columbus Screw & Machine Co., The, 244 Kaiser St., Columbus, Ohio.  
Davis, W. J. & Co., 716 10th Ave., N. Y. City.  
★Mechanical & Electrical Mfg. Co., Rear 2227 Prairie Ave., Chicago, Ill.  
Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich. "Peninsular."  
Schweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich. "S. & W."

**BALL RETAINERS**

- Bossert Co., The, Utica, N. Y. (To order.)  
★Crosby Co., 171-189 Pratt St., Buffalo, N. Y.  
Konigsloew, Otto Mfg. Co., Central Ave. and C. & P. R. R., Cleveland, Ohio.  
★Star Ball Retainer Co., The, Lancaster, Pa. "Star." (Also thrust ball retainers for thrust bearings.)

**BAROMETERS**

- Lloyd, A. J. & Co., 323 Washington St., Boston, Mass. (Aneroid, imported.)  
Taylor Instrument Companies, Rochester, N. Y. "Tycos." (Aneroid.)

**BASKETS**

- (See also Hampers.)  
Burlington Basket Co., Burlington, Iowa. "Hawkeye." (Auto, also refrigerator baskets and baskets with lunch equipment.)  
Heywood Bros. & Wakefield Co., Boston, Mass.  
Seitz, Chas., 512 Third Ave., N. Y. City (Reed.)  
Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Motor Menange."  
★Winship, W. W., 71 Summer St., Boston, Mass.

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Patented November 23, 1909. Other Patents Pending

These joints eliminate all lost motion and give a more perfect control to spark and throttle levers. Easier and cheaper to install than other methods of construction. They are as perfect as it is possible to make them and will last for years.

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No waste of time

No broken finger  
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- American Ever Ready Co., 304-22 Hudson St., N. Y. City. "Eveready." (Auto and motorcycle.)
- Bunnell, J. H. & Co., 20 Park Place, N. Y. City. "Jove."
- Burn-Boston Battery & Mfg. Co., 10 Doane St., Boston, Mass. "Burn-Boston."
- Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill. "Hercules."
- ★Delta Mfg. Co., The, Bloomfield, N. J. "Delta." Electric Mfg. Co., 355 Minnesota St., St. Paul, Minn. "Emco."
- Englewood Carbon Works, The, Wabash Ave. and 65th St., Chicago, Ill. "Xcell."
- French Battery & Carbon Co., Madison, Wis. "Fleur de Lis."
- ★Holtzer-Cabot Electric Co., The, Boston, Mass. "H-C."
- Lincoln Electric Co., 1 Union Square, N. Y. City. "Hi-po." (Waterproof.)
- Loane-Hiltz Engineering Co., 306 S. Hanover St., Baltimore, Md. "Salt Water."
- ★Lutz-Lockwood Mfg. Co., The, Aldene, N. J. "SX."
- Manhattan Electrical Supply Co., 17 Park Pl., N. Y. City. "Red Seal" and "Hi-up."
- Morss, A. S. Co., 210-212 Commercial St., Boston, Mass. "Morss." (Waterproof, marine.)
- National Carbon Co., Lock Drawer L, Cleveland, Ohio. "Columbia Ignitor," "Multiple," "Multiple," "Autocell," "Red Top," "Fail-Light" and "Eastern."
- Ohio Electric Works, 6304 Ellen Ave., N. W., Cleveland, Ohio. "Ohio."
- Rock Island Battery Co., 9th & Sycamore Sts., Cincinnati, Ohio.
- Salt Water Battery Co., 306 S. Hanover St., Baltimore, Md. "Salt Water." (Marine.)
- Semi-Dry Battery Co., The, Fifth & Essex Sts., Harrison, N. J. "Dunn Semi-Dry" and "Semi-Dry." (Auto & motor boat.)
- Stackpole Battery Co., St. Marys, Pa. "Autocrat," "Wizard" and "Radium." (Also motorcycle dry cell tubes.)
- ★Union Battery Co., Belleville, N. J. "Nue," "Union" & "Diamond."
- Universal Carbon Co., Ashland, Mass. "Diamond."
- Vita Mfg. Co., 1151-57 Stanford Ave., Los Angeles, Cal. "Vita," "King" & "L-A."
- Waite Auto Supply Co., 17 Dorrance St., Providence, R. I. "Waite Success."
- Waterbury Battery Co., Waterbury, Conn.
- Wesco Supply Co., 7th St. & Clark Ave., St. Louis, Mo. "Red Shield Auto."
- Westchester Appliance Co., 13-15 Canal Place, Bronx Borough, N. Y. City. "Westchester."
- Western Electric Co., 465 West St., New York, N. Y. "Hawthorn."
- White Star Battery Co., 126 Chambers St., N. Y. City. "Red Star" & "White Star."
- Wilhelm, The H. Battery Co., 70-72 Frost St., Brooklyn, N. Y.
- Ampvo Battery Co., 1607 Michigan Ave., Chicago, Ill. "Ampvo" & "Hero."
- ★Apple Electric Co., 20 N. Canal St., Dayton, Ohio. "Aploco."
- Astral Storage Battery Co., 718 Jackson Blvd., Chicago, Ill. "Astral."
- Atkin-Wheeler, Halesite, Huntington Harbor, L. I., N. Y. "A-W." (Generator for ignition and lighting in motor boats.)
- Auto Battery & Electrical Co., 774 Main St., Buffalo, N. Y.
- Benoist Bros. Mfg. Co., 3923 Olive St., St. Louis, Mo. "Black Jack."
- Bison Storage Battery Co., Buffalo, N. Y. "Bison" & "Bison, Jr."
- Burn-Boston Battery & Mfg. Co., 10 Doane St., Boston, Mass. "Burn-Boston."
- Churcher Electric & Mfg. Co., 117-134 Opera Place, Cincinnati, Ohio.
- Cleveland Electric Vehicle Co., 1206-1212 Huron Road, Cleveland, Ohio. "Cuyahoga."
- Commercial Battery Co., 718 Jackson Blvd., Chicago, Ill. "Combat Igniter."
- ★Dayton Electrical Mfg. Co., The, 89 St. Clair St., Dayton, Ohio. "Apple" and "Hubler-Dayton."
- Eagle Storage Battery Co., The, 269 West 17th St., N. Y. City. "Eagle."
- ★Edison Storage Battery Co., Orange, N. J.
- ★Electric Storage Battery Co., 19th & Allegheny Ave., Phila., Pa. "Exide" & "Duplex-Exide."
- Electric Supply & Battery Co., 7510 Woodland Ave., S. E., Cleveland, Ohio.
- Empire Battery Co., Inc., 1876 Broadway, N. Y. City. "Empire."
- Excelsior Storage Battery Co., The, 14 East 116th St., N. Y. City. "Marvel."
- ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "XLCR."
- Geiszler Bros. Storage Battery Co., 514-516 W. 57th St., N. Y. City. "Geiszler" and "Midget."
- Gerdelman, Benj. Mfg. Co., 4630 Olive St., St. Louis, Mo. "A-Z."
- Gould Storage Battery Co., 341 Fifth Ave., N. Y. City. "Gould."
- Hall Storage Battery Co., The, 1056-60 St. Clair Ave., N. E., Cleveland, Ohio. "Kremlo" & "Combat."
- Heissler Storage Battery Co., 1425 Michigan Blvd., Chicago, Ill.
- Helios Mfg. Co., Bridesburg, Pa. "Helios."
- Hoosier Storage Battery Co., 212-216 E. Pennsylvania St., Evansville, Ind. "Firefly" & "Hobo."
- Jewel Electric Co., 271-273 Michigan Ave., Chicago, Ill. "Jewel."
- Keeler Battery Co., 134 Ontario St., Toledo, Ohio. "Keeler."
- Kilbourne & Clark Co., 307 First Ave., S., Seattle, Wash. "Kilbourne."
- Kitsee Battery Co., Wilkes Barre, Pa. "K. C."
- Knop Battery Co., 69 Atwater St., East, Detroit, Mich. "Michigan."
- ★Kuehn & Metz, 1900 Broadway, N. Y. City. "X.L."
- Lemke-Briggs Electric Co., 9, 10 & 11 Miller Bldg., Milwaukee, Wis. "L-B."
- Look Electric Co., The, 1545 Michigan Ave., Chicago, Ill.
- ★Lutz-Lockwood Mfg. Co., The, Aldene, N. J. "Gordon" & "Lutz."
- MacRae, H. C., 314 St. Paul St., Baltimore, Md. "Champion."
- Marko Storage Battery Co., 102 Jefferson Ave., Brooklyn, N. Y. "Marko."
- Miller, Geo. J. Storage Battery Co., 733 Woodward Ave., Detroit, Mich.
- Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radium," "Victor," "Simplex" & "Masco."
- ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill. "Trish."
- Muller, Albert, 145 W. 49th St., N. Y. City. "Porox."
- National Steel Products Co., The, Lorain, O.
- Northern Sales Co., Ashland, Wis.

**BATTERIES, Ignition (Storage)**

- Ajax Battery Co., 1532 Michigan Ave., Chicago, Ill. "Ajax."
- Alvern Battery Co., Evansville, Ind. "Alvern."
- American Battery Co., 1132-34 Fulton St., Chicago, Ill. "Invincible."
- American Storage Battery Co., 8 Congress St., Boston, Mass. "Harvard."

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 Oshburn Electric Co., 66 Fort St., East Detroit, Mich. "Oshburn."  
 Perfection Igniter Mfg. Co., 1093 Bedford Ave., Brooklyn, N. Y. "Perfection." (Auto & marine.)  
 Philadelphia Storage Battery Co., Ontario & C Sts., Phila., Pa.  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. "Phoenix."  
 Pumpelly Battery Co., 1202-12 East 22nd St., Indianapolis, Ind. "Pumpelly."  
 Reflex Ignition Co., The, 6919 Lexington Ave., Cleveland, O.  
 Rumsey Electric Co., 327 Jefferson Ave., Detroit, Mich.  
 Schug Electric Mfg. Co., 320 Jefferson Ave., Detroit, Mich.  
 Silicia Storage Battery Co., 29 W. 23rd St., N. Y. City. "Silicia."  
 Silvey, W. L., Dayton, O. "Silvey."  
 Storage Battery Lighting Co., 239 Railway Exchange Bldg., Chicago, Ill.  
 ★Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City. "Reliable," "Reliance" & "Hudson-Fulton."  
 ★Tray Plate Battery Co., 24 Wall St., Birmingham, N. Y. "High Efficiency."  
 Tritt Electric Co., The, Union City, Ind.  
 United Electric Storage Battery Co., 2107 Pine St., St. Louis, Mo. "Acme" & "Peerless."  
 United States Light & Heating Co., 30 Church St., N. Y. City. "National."  
 ★Universal Electric Storage Battery Co., 301-09 Peoria St., Chicago, Ill. "Universal."  
 Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. "Vesta."  
 Vivax Storage Battery Co., 2224-2234 Michigan Ave., Chicago, Ill. "Vivax" & "Duro."  
 Volkcar Storage Battery Co., 2441-43 Michigan Ave., Chicago, Ill. "Volkcar."  
 Waterbury Battery Co., Waterbury, Conn.  
 Westinghouse Storage Battery Co., Boonton, N. J. "Westinghouse," "Bijur" & "Reserve."  
 ★Willard Storage Battery Co., Marquette Rd. & Lakeside, Cleveland, O. "Autex."  
 Witherbee Igniter Co., 1876 Broadway, N. Y. City. "Witherbee" & "Witherbee, Jr."  
 Zoar Battery Co., The, Zoar, Ohio. "Zoar."

**BATTERIES, Vehicle**

- Alvern Battery Co., Evansville, Ind. "Alvern."  
 American Battery Co., 1132-34 Fulton St., Chicago, Ill. "American."  
 American Storage Battery Co., 8 Congress St., Boston, Mass. "Harvard."  
 Bison Storage Battery Co., Buffalo, N. Y. "Bison."  
 Churcher Electric & Mfg. Co., The, 117-134 Opera Place, Cincinnati, Ohio.  
 Cleveland Electric Vehicle Co., 1206-1212 Huron Road, Cleveland, Ohio. "Cuyahoga."  
 ★Edison Storage Battery Co., Orange, N. J. "Edison."  
 ★Electric Storage Battery Co., 19th St. & Allegheny Ave., Phila., Pa. "Exide" & "Hy-cap-Exide."  
 Frtchle Automobile & Battery Co., The, 1510-30 Clarkson St., Denver, Colo. "100-Mile Electric."  
 Geisler Bros. Storage Battery Co., 514 and 516 W. 57th St., N. Y. City. "Geisler" and "Midget."

- Gould Storage Battery Co., 341 Fifth Ave., N. Y. City. "Gould."  
 Helios Mfg. Co., Bridesburg, Pa. "Helios."  
 Hoosier Storage Battery Co., 212-216 E. Pennsylvania St., Evansville, Ind. "Hoosier."  
 Jewel Electric Co., 271-273 Michigan Ave., Chicago, Ill. "Jewel."  
 Knop Battery Co., 69 Atwater St., East, Detroit, Mich. "Michigan."  
 Look Electric Co., The, 1545 Michigan Ave., Chicago, Ill.  
 Miller, Geo. J. Storage Battery Co., 733 Woodward Ave., Detroit, Mich.  
 Niagara Lead Co., Niagara Falls, N. Y. "Niagara."  
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 Philadelphia Storage Battery Co., Ontario & C Sts., Philadelphia, Pa.  
 Pumpelly Battery Co., 1202-12 East 22nd St., Indianapolis, Ind. "Pumpelly."  
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 ★Storage Battery Supply Co., 239 E. 27th St., N. Y. City.  
 ★Tray Plate Battery Co., 24 Wall St., Binghamton, N. Y. "High Efficiency."  
 United Electric Storage Battery Co., 2107 Pine St., St. Louis, Mo. "California."  
 United States Light & Heating Co., 30 Church St., N. Y. City. "National."  
 Universal Electric Storage Battery Co., 301-09 N. Peoria St., Chicago, Ill. "Universal."  
 Vivax Storage Battery Co., 2224-2234 Michigan Ave., Chicago, Ill. "Vivax."  
 Volkcar Storage Battery Co., 2441-43 Michigan Ave., Chicago, Ill. "Volkcar."  
 Westinghouse Storage Battery Co., Boonton, N. J. "Westinghouse" & "Bijur."  
 ★Willard Storage Battery Co., Marquette Rd. & Lakeside, Cleveland, O. "Autex."  
 Winter Storage Battery Co., 2959 Indiana Ave., Chicago, Ill.  
 Zoar Battery Co., The, Zoar, Ohio. "Zoar."

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- Binns Chemical Works, 164 Front St., N. Y. City.  
 Grasselli Chemical Co., Cleveland, O. "Grasselli."  
 Kalbfleisch, Franklin H. Co., Metropolis Bldg., N. Y. City.  
 Sholes, Charles E. Co., 164 Front St., N. Y. City. (Electrolyte.)  
 ★Storage Battery Supply Co., 239 E. 27th St., N. Y. City.  
 Witherbee Igniter Co., 1876 Broadway, N. Y. City.

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- American Body Co., The, 1255-63 Niagara St., Buffalo, N. Y.  
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 Auto Sheet Metal Works, 2228 Michigan Ave., Chicago, Ill. (Battery.)

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is dependent upon the power that operates it. You want a storage battery that is reliable, of long life and that requires little attention;—a battery on which you can absolutely depend at all times. When you buy renewals, or if you contemplate purchasing an electric, *insist* on the "Eveready."

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- ¶ Because "Eveready" batteries are used in over 90% of all electric cars manufactured.
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Write for the name of the Distributor nearest you

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 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Battery.)  
 Clayton's Sons, Frank B., 1222-4 Race St., Phila., Pa. (Battery.)  
 Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn. (Wood, coil.)  
 ★Delta Mfg. Co., The, Bloomfield, N. J. "Delta." (Battery.)  
 Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich. (Battery.)  
 Fickling & Co., 304-306 W. 49th St., N. Y. City. (Battery.)  
 ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, Ohio. "Globe." (Sheet steel battery boxes.)  
 Graves & Congdon Co., Carriage Ave., Amesbury, Mass. (Battery.)  
 Guarantee Tire & Rubber Co., The, 208-210 S. Illinois St., Indianapolis, Ind. "Long Distance." (Battery.)  
 Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich. (Battery.)  
 Household Cabinet Works, 145 Crary St., Providence, R. I. (Coil.)  
 Hunt & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, Ohio. (Battery, metal.)  
 Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C. (Holders.)  
 Jordan, Edward B. & Co., 129 De Graw St., Brooklyn, N. Y.  
 Kinsey Mfg. Co., Toledo, Ohio. "Kinwood." (Battery.)  
 Leibe, F. G., 39 & 41 Grafton Ave., Newark, N. J.  
 Maron, Frank A., 320-322 Pearl St., N. Y. City. (Boxes.)  
 Morss, A. S. & Co., 210-212 Commercial St., Boston, Mass. "Morss." (Hermatic cases.)  
 Mullins, W. H. Co., Salem, O. (Metal, battery.)  
 National Coil Co., 412 Michigan Ave., E., Lansing, Mich. (Battery.)  
 New Britain Sheel Metal Co., New Britain, Conn. (Metal.)  
 Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O. (Battery.)  
 Plymouth Novelty Mfg. Co., Plymouth, Ind. (Coil.)  
 ★Rumpp, C. F. & Sons, 5th & Cherry Sts., Phila., Pa. (Battery.)  
 Schoenborn, A. J., 109 S. 14th St., Atchison, Kans.  
 Standard Cabinet Mfg. Co., Peru, Ind.  
 Stanley & Patterson, 23 Murray St., N. Y. City. ("Patterson" wireless battery holder for autos and "Watertite" for boats.)  
 Stokes, Joseph Rubber Co., Trenton, N. J. (Hard rubber battery cases.)  
 Sumter Telephone Mfg. Co., The, Sumter, S. C. (Wood; also "Mason" battery holders.)  
 Tolliner's Sons Co., Chas., Pulaski, N. Y. (Coil.)  
 Union Hardware Co., Torrington, Conn. (Spark coil.)  
 West, F. M. Box Co., Springfield, Mass.  
 Wireless Battery Box Co., The, 209 Locust St., Toledo, O. (Self-connecting wireless.)  
 Witherbee Igniter Co., 1876 Broadway, N. Y. City. (Battery.)

**BATTERY CONNECTIONS**

(See also Terminals, Wire.)

American Ever Ready Co., 304-322 Hudson St., N. Y. City. "Eveready Bulldog."  
 Auto Accessory Co., 75 Florence St., Worcester, Mass. "Presto."

Barcy & Nicholson, 967 Howard St., Detroit, Mich. "Bar Nic."  
 ★Eliss-Chester Co., 31 Mathewson St., Providence, R. I.  
 Bolton, Geo. W., 260 Wreford Ave., Detroit, Mich. "Simplex" & "Perfecto."  
 Briggs, W. H., 329 Chestnut St., Richmond Hill, N. Y. "Briggs."  
 Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Handy."  
 Electric Motor & Equipment Co., 232 Market St., Newark, N. J.  
 ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Quick Action."  
 Fahnestock Electric Co., The, 129 Patchen Ave., Brooklyn, N. Y. "Fahnestock."  
 Goodson Elec. & Mfg. Co., 88-94 Point St., Providence, R. I.  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Herz."  
 Knoblock-Heideman Mfg. Co., The, South Bend, Ind. "Quick Action."  
 Lemke-Briggs Electric Co., 9, 10, 11 Miller Bldg., Milwaukee, Wis. "L-B."  
 Lockwood Ash Motor Co., Jackson, Mich.  
 Manhattan Electrical Supply Co., 17 Park Place, N. Y. City. "Sta-There."  
 ★Monroe Electrical Mfg. Co., Monroe, Mich.  
 ★Morse, Frank W., 516 Atlantic Ave., Boston, Mass.  
 ★Mosler, A. R. & Co., 163 W. 29th St., N. Y. City. "Pull-Push."  
 National Carbon Co., The, Lock Drawer L, Cleveland, Ohio.  
 National Steel Products Co., The, Lorain, O. "Cleveland."  
 ★Never-Miss Spark Plug Co., Lansing Mich. "Never-Miss."  
 O. K. Connector Co., 49 Waldo St., Worcester, Mass. "O. K."



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FOOT RESTS and ROBE RAILS

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Cleveland, Ohio

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## BATTERY CONNECTIONS—Continued

- ★Pittsfield Spark Coil Co., Pittsfield, Mass.  
Read, Henry R., 45 Kingston Ave., Brooklyn,  
N. Y. "Read."
- Shain, Chas. D., 70 Murray St., N. Y. City.
- Stackpole Battery Co., St. Marys, Pa. "Mills"  
& "Stackpole."
- Sumter Telephone Mfg. Co., The, Sumter, S.  
C. "Mason."
- Tregoning Elec. Mfg. Co., The, Cleveland, O.  
"Lobster Claw."
- Volta Mfg. Co., 1151-57 Stanford Ave., Los  
Angeles, Cal.

## BATTERY GAUGES

(See "Ammeters" & "Voltsmeters.")

## BATTERY JARS

- American Hard Rubber Co., N. Y. City. (Hard  
rubber.)
- ★Diamond Rubber Co., Akron, O. "Diamond."  
(Hard rubber.)
- ★Morgan & Wright, Foot of Bellevue St., De-  
troit, Mich.
- Stokes, Joseph, Rubber Co., Trenton, N. J.  
(Hard rubber.)
- Storage Battery Supply Co., The, 239 E. 27th  
St., N. Y. City. (Rubber and celluloid.)
- Vulcanized Rubber Co., 488 Broadway, N. Y.  
City. (Rubber.)

## BEARINGS, Ball

(See Ball Bearings.)

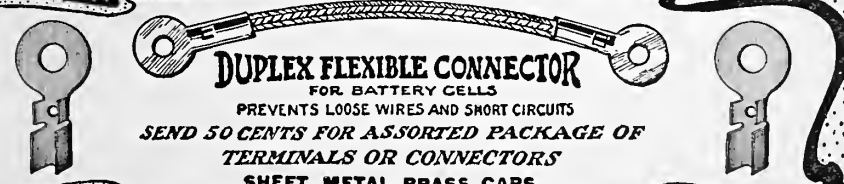
## BEARINGS, Roller

(See Roller Bearings.)

## BEARINGS, PLAIN, & BUSH- INGS

- Allen Fire Department Supply Co., Eddy St.,  
Providence, R. I. (Graphite bearings &  
brass bushings.)
- ★American Bronze Co., Berwyn, Pa. "Non-  
Gran." (Cored bars.)
- American Die Casting Co., Indianapolis, Ind.  
(Bearings.)
- Baird Machine & Mfg. Co., 11-23 Raynor St.,  
Detroit, Mich. (Bronze.)
- Bauer Machine Co., Jeffersonville, Ind.  
(Bushings.)
- ★Boston Gear Works, Norfolk Downs, Mass.  
(Bearings.)
- Bunting Brass & Bronze Co., Alliance, Ohio.  
(Machined bushings.)
- Detroit Motor Castings Co., 299-303 Beaufait  
Ave., Detroit, Mich. (Bronze & babbit  
bushings.)
- ★Doehler Die Casting Co., 189 W. 9th St.,  
Brooklyn, N. Y. "Doehler." (Finished.)
- Franklin, H. H. Mfg. Co., Automobile Depart-  
ment, 402 S. Geddes St., Syracuse, N. Y.  
"Franklin." (Bushings.)
- Graphite Lubricating Co., Bound Brook, N. J.  
(Graphite & bronze oilless bearings &  
"Bound Brook" bushings.)
- Hoyt Metal Co., Merchants' LaCade Bldg., St.  
Louis, Mo. "Hoyt." (Bushings.)
- Michigan Lubricator Co., 661-671 Beaubien  
St., Detroit, Mich. (Bronze.)
- ★National Tube Co., Frick Bldg., Pittsburg, Pa.  
Neustadt Auto & Supply Co., 3948-50 Olive  
St., St. Louis, Mo. (Ball thrust bearings.)
- ★Ohio Brass Co., Mansfield, O. (To order.)
- Parker White Metal & Machine Co., East 10th  
St. & Phila. & Erie R. R., Erie, Pa.  
"Parker."
- Reese, S. Machine & Tool Works, 224 W. Main  
St., Plymouth, Pa. (Bronze.)
- Spacke, The F. W. Machine Co., Madison Ave.,  
Merrill & Penn Sts., Indianapolis, Ind.  
(Die cast bushings.)
- Standard Roller Bearing Co., 50th & Lancas-  
ter Ave., Philadelphia, Pa. "SRB."  
(Thrust bearings.)
- ★Standard Welding Co., The, 76th St., N. W.  
& L. S. & M. S. R. R., Cleveland, O.  
(Bushings.)

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**DUPLEX FLEXIBLE CONNECTOR**  
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**BEARINGS, Plain, & Bushings—Continued**

- ★Timken-Detroit Axle Co., The, Clark Ave. & Pere Marquette R. R., Detroit, Mich. (Bearings.)
- U. S. Reduction Co., Chicago, Ill. (Die cast bearings.)
- Vanadium Metals Co., Frick Bldg., Pittsburg, Pa. (Bronze.)
- ★Van Wagner, E. B. Mfg. Co., Syracuse, N. Y. (Die cast bearings.)
- Wing, J. T. & Co., 15-19 Woodward Ave., Detroit, Mich. (Die cast bushings.)

**BEARING METAL**

- ★American Bronze Co., Berwyn, Pa. "Non-Gran." (Bronze.)
- American Manganese Bronze Co., 99 John St., N. Y. City. "Spare's."
- Birkenstein, S. & Sons, 60-70 Ontario St., Chicago, Ill. (Babbitt metal.)
- Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn. (Anti-friction metals.)
- Challenge Brass Co., 501 Quinpiac Ave., New Haven, Conn. (Babbitt & bronze.)
- ★Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y. "Plata Metal"; "Superior." (Babbitt metal.)
- Columbia Smelting & Refining Works, 365 West St., N. Y. City. "Columbia Brand." (Babbitt.)
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- Damascus Bronze Co., Pittsburg, Pa. "Globe."
- Dodge Mfg. Co., Mishawaka, Ind. "Dodge."
- Edna Smelting & Refining Co., The, 525-31 Reading Road, Cincinnati, O. (Babbitt metal.)
- Empire Metal Co., Syracuse, N. Y. "Empire." (Babbitt.)
- Fahrig Metal Co., 316-322 Hudson St., N. Y. City. "Fahrig," "H. & H." (Babbitt.)
- Fort Hill Bronze Mfg. Co., 48-56 Waters Ave., West Everett, Mass. "Fort Hill." (Bronze.)
- Frictionless Metal Co., Chattanooga, Tenn. "Frictionless." (White brass.)
- Fries & Co., 91 Main St., Buffalo, N. Y.
- Gardiner Metal Co., 1356-64 W. Lake St., Chicago, Ill.
- Globe Metal Co., 401 W. Ontario St., Chicago, Ill. "Wizard."
- Hardy, Wm. A. & Sons Co., 113 Water St., Fitchburg, Mass.
- Homer Brass Works, 231 Race St., Phila., Pa. (Bearing bronze.)
- Hoyt Metal Co., Merchants' LaCledde Bldg., St. Louis, Mo. "Hoyt's Nickel Genuine" & "Hoyt's (gas engine babbitt.)"
- "Hub" Foundry & Plating Co., The, Ossining, N. Y. "Hub."
- ★Light Mfg. & Foundry Co., Union & Queen Sts., Pottstown, Pa. (Plastic bronze, manganese bronze & "Mascof" babbitt.)
- Lumen Bearing Co., Buffalo, N. Y. (Babbitt.)
- Magnolia Metal Co., 113-15 Bank St., N. Y. City. "Magnolia" & "Adamant."
- Manning, Maxwell & Moore, Inc., N. Y. City. (Frictionless.)
- ★Merchant & Evans Co., 517 Arch St., Phila., Pa. "Genuine."
- Millett Brass Co., Highland Station, Springfield, Mass. (Also babbitt metals.)
- Mogul Metal Co., 149-151 Larned St., W., Detroit, Mich. ("No. 407" nickel babbitt, "408 Motor," "Mogul" & "Duro." babbitt.)
- Muzzy-Lyon Co., Ltd. (See Mogul Metal Co.)
- National Lead Co., 111 Broadway, N. Y. City. "Phoenix Metal."

- New Era Mfg. Co., The, Kalamazoo, Mich. "New Era" (white brass, white phosphor bronze and babbitt.)
- Palmetto Reduction Co., 1609 Washington St., Chicago, Ill. (Babbitt metal.)
- Paulson, Thomas & Son, 13 Fulton St., Brooklyn, N. Y. "Hecla" (anti-friction bronze, babbitt metals.)
- Phosphor Bronze Smelting Co., 2200 Washington Ave., Phila., Pa. "Elephant."
- Pittsburg White Metal Co., 3116-18 Penn Ave., Pittsburg, Pa. (Babbitt and Anti-Friction.)
- Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa.
- Reeves Pulley Co., Columbus, Ind. "Reeves."
- Shonberg, L., 363 Hudson Ave., Brooklyn, N. Y. "Shonberg's." (Bronze.)
- Stillman-White Foundry, Bark St., Providence, R. I. (Babbitt metal.)
- Tanite Co., The, Stroudsburg, Pa. "Pocono." (Babbitt.)
- Turner Brass Works, The, Sycamore, Ill.
- U. S. Aluminum Castings Co., Vandalia Ave., Cincinnati, O. (Babbitt & bronze.)
- U. S. Bronze Co., Cleveland, O. (Babbitt.)
- U. S. Reduction Co., Chicago, Ill.
- Vanadium Metals Co., Frick Bldg., Pittsburg Pa. "Victor Vanadium." (Anti-friction babbitt metal.)
- Wambold Mfg. Co., 3009-21 Lisbon Ave., Milwaukee, Wis.
- Wells Chemical Bronze Works, 219 Summer St., Worcester, Mass. "Wells Chemical" (babbitt metal.)
- Wildes, Thomas Sons, 21 Maiden Lane, N. Y. City. "Semper Idem."
- Williams, E. A. & Son, 76 Montgomery St., Jersey City, N. J.
- Wing, J. T. & Co., 15-19 Woodward Ave., Detroit, Mich.
- Wolff Metal Co., 1803-11 John St., Cincinnati, Ohio.

**BELLS, Cycle & Motorcycle**

- Bevin Bros. Mfg. Co., East Hampton, Conn. "Bevin."
- Duck, A. W., 427 15th St., Oakland, Cal. "Duck." (Twisted round leather.)
- East Hampton Bell Co., East Hampton, Conn.
- ★Mossberg, Frank Co., Attleboro, Mass. "Mossberg."
- ★New Departure Mfg. Co., The, Bristol, Conn. "New Departure."

**BELLS, Auto & Motor Boat**

- East Hampton Bell Co., East Hampton, Conn.
- Edwards & Co., Inc., 14th & Exterior Sts., N. Y. City. "Recti" (electric).
- Kaufmann, Chas, 28 Main St., Oshkosh, Wis. (Motor boat.)
- ★Mossberg, Frank Co., Attleboro, Mass. "Mossberg."
- ★National Tube Co., Frick Bldg., Pittsburg, Pa. "Shelby."
- ★New Departure Mfg. Co., Bristol, Conn. "New Departure."
- Noank Motor Co., The, Noank, Conn. (Motor boat.)

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THE CAR WITHOUT EVEN BEING SCRAPED  
STILL RUNNING      RUNNING STILL.



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Stronger than steel.  
Thousands in use.  
None have ever  
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In these days, when competition is so keen, any old bearings will not do. You must have the best that can be secured,—those cheapest in the long run, not lowest in the first cost. If you follow the lead of those who have been through the mill and **KNOW** a thing or two about Bearings, you will specify **FORT HILL BRONZE**. It is used for metallic packings on the United States Battleship Vermont, which statement proves that its quality is beyond reproach.

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- Apex Belting Co., 242 Chestnut St., Phila., Pa.  
 "Shoemaker." (V & flat.)  
 Automobile Supply Mfg. Co., 224 Taaffe Place,  
 Brooklyn, N. Y.  
 Biddison Mfg. Co., The, 1516 Williamson St.,  
 Madison, Wis. "True Blue."  
 Bradford Belting Co., The, Cincinnati, Ohio.  
 "Monarch." (V or flat.)  
 Chicago Rawhide Mfg. Co., 348-50 Ohio St.,  
 Chicago, Ill. "Krome."  
 Detroit Leather Works, 844 Woodward Ave.,  
 Detroit, Mich. "Flexo."  
 Eureka Spring Co., 347 W. Broadway, N. Y.  
 City. (Steel.)  
 Gardner Mfg. Co., 5637-39 Ohio St., Chicago,  
 Ill. "Calcutts."  
 Gilmer, L. H. Co., 52 N. 7th St., Phila., Pa.  
 "Gilmer" (woven).  
 Heaney Mfg. Co., 164 State St., Boston, Mass.  
 "Heaney's" (fan belts).  
 Hudson Belting Co., 1-3 Eaton Pl., Worcester,  
 Mass.  
 Jones, W. A. Foundry & Machine Co., North  
 Ave. & Noble St., Chicago, Ill.  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., De-  
 troit, Mich. "McCord." (Wire.)  
 National Leather Mfg. Co., Niles, Mich.  
 New York Leather Belting Co., 51 Beekman  
 St., N. Y. City. (Canvas and leather.)  
 New York Wire & Spring Co., 586-8 Washing-  
 ton St., Hoboken, N. J. "Bull Dog."  
 (Wire.)  
 Peerless V Belt Co., The, 334-38 South Clinton  
 St., Chicago, Ill. "Peerless."  
 Philadelphia Steel & Wire Co., 525 Commerce  
 St., Phila., Pa. "Powco." (Spiral wire.)  
 Rahmann, George & Co., 6 Ferry St., N. Y.  
 "Amazon."  
 Schieren, Chas. A. Co., Schieren Bldg., N. Y.  
 City. "Amazon."  
 Waban Webbing Co., 16 South St., Boston,  
 Mass. "Bullet Proof." (Webbing.)  
 Webb Mfg. Co., Front & Centre Sts., Newark,  
 N. J. "Webb." (Wire.)  
 Williams, I. B. & Sons, Dover, N. H.

**BELTS, Motor Cycle**

- ★American Belting & Tanning Co., 135 Oliver  
 St., Boston, Mass.  
 Apex Belting Co., 242 Chestnut St., Phila., Pa.  
 "Shoemaker." (V & flat.)  
 Bristol Co., Waterbury, Conn. "Bristol."  
 (Steel.)  
 Chicago Raw Hide Mfg. Co., The, 348-50 Ohio  
 St., Chicago, Ill.  
 ★Empire Tire Co., Trenton, N. J. "Empire."  
 (V belts.)  
 Geer, Harry R. Co., 856 McLaran St., St.  
 Louis, Mo.  
 ★Goodrich, B. F. Co., Akron, Ohio. (Rubber.)  
 Graton & Knight Mfg. Co., 94-104 Blooming-  
 dale Rd., Worcester, Mass.  
 Magnet Motor Co., 1400 Michigan Ave., Chi-  
 cago, Ill. (Rubber & leather, imported.)  
 Merkel-Light Motor Co., The, Pottstown, Pa.  
 ★N. S. U. Motor Co., 206 W. 76th St., N. Y.  
 City. ("Shamrock Gloria" rubber & "N. S.  
 U." leather.)  
 National Leather Mfg. Co., Niles, Mich.  
 Peerless V Belt Co., The, 334-38 S. Clinton St.,  
 Chicago, Ill. "Peerless-V-Belt."  
 Pennsylvania Rubber Co., Jeannette, Pa.  
 (Rubber.)  
 Prospect Motor Co., 1900 Broadway, N. Y.  
 City.  
 Rahmann, Geo. & Co., 6 Ferry St., N. Y.  
 City. "Amazon."  
 Royal Motor Works Co., Worcester, Mass.  
 "Watawata." (V belts, imported.)

- Schieren, Chas. A. Co., Schieren Bldg., N. Y.  
 City.  
 Widmayer, F. B. Co., 2312 Broadway, N. Y.  
 City.

**BELT & CLUTCH DRESSING**

- American Oil Co., 170-78 S. Water St., Jack-  
 son, Mich.  
 ★Buffalo Specialty Co., 375-377 Ellicott St., Buf-  
 falo, N. Y.  
 Callahan, Geo. & Co., 218 Front St., N. Y.  
 City. "Callahan's Anti-Slip."  
 Cleveland Auto-Clutch Dressing Co., Cleve-  
 land, Ohio. "Slip-Not."  
 Cortland Specialty Co., 176 Railroad St., Cort-  
 land, N. Y. "Banner."  
 Crescent Belt Fastener Co., 143 E. 23rd St.,  
 N. Y. City. "Handy Bar."  
 Eagle Lubricating Oil Co., 426-28 First Ave.,  
 Pittsburg, Pa.  
 Ensign Refining Co., The, 10605 Quebec Ave.,  
 Cleveland, Ohio.  
 Gandy Belting Co., The, 728-40 W. Pratt St.,  
 Baltimore, Md. "Gandy."  
 Graton & Knight Mfg. Co., 94-104 Blooming-  
 dale Rd., Worcester, Mass. "Star Bar"  
 & "Royal Worcester."  
 Houghton, E. F. & Co., 240 W. Somerset St.,  
 Phila., Pa. "Houghton's."  
 Lynch, Alonzo K., Inc., 310-12 Flushing Ave.,  
 Brooklyn, N. Y. "Champion."  
 Panama Oil & Grease Co., 159 West 51st St.,  
 N. Y. City.  
 Philadelphia Belting Co., 313-315 Vine St.,  
 Phila., Pa.  
 Schilling, Frederick, 365 Pearl St., N. Y. City.  
 Standard Leather Washer Mfg. Co., 24-26  
 Boudinot St., Newark, N. J. "Gray's Vel-  
 vet."  
 Sullivan Oil Co., 413 Wells St., Chicago, Ill.  
 Victor Clutch Compound Co., Nashua, N. H.  
 "Victor."

**BELT FASTENERS**

- Crescent Belt Fastener Co., 143 E. 23rd St., N.  
 Y. City. "Crescent."  
 Graton & Knight Mfg. Co., 94-104 Blooming-  
 dale Road, Worcester Mass. "Royal Wor-  
 cester." (Lacing.)  
 Majestic Mfg. Co., Worcester, Mass. "Ma-  
 jestic." (For motorcycle belts.)  
 ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City.  
 "N. S. U."  
 Prospect Motor Co., 1900 Broadway, N. Y.  
 City. "Simplex." (For motorcycle belts.)  
 Smith, F. P. & Co., Sharon Hill, Pa.  
 "Smithicks."

**BENDINGS, Wood**

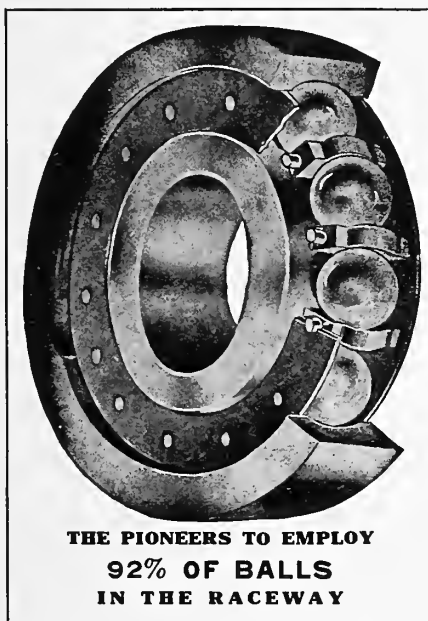
- Acme Veneer & Body Co., Rahway, N. J.  
 American Veneer Co., 100 Market St., Kenil-  
 worth, N. J.  
 Dann Bros. & Co., The, 80-86 Franklin St.,  
 New Haven, Conn.



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SOLE IMPORTERS

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Downey Bros. Spoke & Bending Co., 240 Harrisburg Ave., Lancaster, Pa.  
Frantz Body Mfg. Co., Akron, Ohio.  
Howarth & Rogers Co., Oak St., Amesbury, Mass.  
Shepard, H. G. & Sons, James & River Sts., New Haven, Conn.  
Tucker Wood Work Co., Sidney, Ohio.  
Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.

Hall, Chas. E. Co., 106 Broadway, Buffalo, N. Y.  
Ideal Plating Co., Inc., Marlboro, Mass "Ideal." (Handle bar stems.)  
Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. (Speedometer brackets.)  
★Ohio Brass Co., Mansfield, Ohio. (To order.)  
Stevens & Co., 375 Broadway, N. Y. City.

### BICYCLES

Appeal Mfg. & Jobbing Co., Los Angeles, Cal. "Appeal."  
Arnold, Schwinn & Co., 1718-32 N. 43rd St., Chicago, Ill. "World" & "Admiral."  
★Consolidated Mfg. Co., The, Toledo, Ohio. "Yale" & "Snell."  
Economy Cycle Supply Co., Detroit, Mich. "Economy."  
★Emblem Mfg. Co., Angola, N. Y. "Emblem."  
★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Excelsior," "Triumph," "Standard."  
Fowler-Manson-Sherman Cycle Mfg. Co., 900-910 W. Lake St., Chicago, Ill. "Fowler, Manson & Sherman."  
Gendron Wheel Co., Toledo, O. "Gendron," "Reliance" & "Signal."  
Great Western Mfg. Co., La Porte, Ind. "Crown."  
Johnson's, Iver Arms & Cycle Works, Fitchburg, Mass. "Iver Johnson."  
Merkel-Light Motor Co., The, Pottstown, Pa. "Light."  
Miami Cycle & Mfg. Co., Grand Ave., Middletown, Ohio. "Racycle" & "Hudson."  
National Cycle Mfg. Co., Bay City, Mich. "National."  
Pierce Cycle Co., The, 6-22 Hanover St., Buffalo, N. Y. "Pierce."  
Pope Mfg. Co., The, Hartford, Conn. "Ideal," "Crescent," "Monarch," "Imperial," "Columbia," "Hartford," "Cleveland," "Westfield," "Tribune," "Stormer," "Rambler," "Fay Juvenile," "Pope Daily Service" & "Sterling."  
★Reading Standard Co., Reading, Pa. "Reading Standard."  
Toledo Metal Wheel Co., Toledo, Ohio. "Toledo."  
Vim Cycle & Hardware Co., 228-230 Broadway, Buffalo, N. Y. "Vim."  
Wolverine Leather Goods Co., 51-59 Fort St., East, Detroit, Mich. "Wheeler."

### BICYCLE & MOTOR CYCLE FITTINGS, Miscellaneous

Clark & Son, A. N., Plainville, Conn. (Stamped.)  
Crescent Tool Co., Jamestown, N. Y. (Bicycle handle bar stems.)  
Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y. "Forsyth."

### BINDING POSTS, Electric

Fahnestock Electric Co., The, 129 Patchen Ave., Brooklyn, N. Y. "Fahnestock." (Spring.)  
Western Electric Co., The, 465 West St., N. Y. City.

### BLOCKS, Chain

(See Cranes & Hoists.)

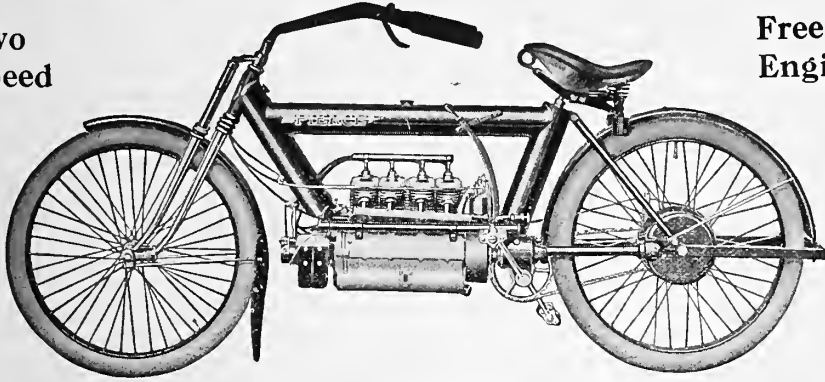
### BOAT LIGHTING OUTFITS

★Apple Electric Co., 20 N. Canal St., Dayton, Ohio. "Aplco."  
★Brownell, F. A. Motor Co., 634-36 Lexington Ave., Rochester, N. Y.  
Carlisle & Finch Co., 229 E. Clifton Ave., Cincinnati, O.  
Dayton Electric Mfg. Co., The, 89 St. Clair St., Dayton, Ohio. "Dayton."  
Elbridge Engine Co., Culver Road, Rochester, N. Y. "Elbridge."  
Jager, Chas. J. Co., 281-285 Franklin St., Boston, Mass.  
Kitsee Battery Co., Wilkes-Barre, Pa. (Electric.)  
Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."  
Lamont & Steers Engine Co., Stegmeyer's Boat Harbor, Rear 1470 Jefferson Ave., E., Detroit, Mich.  
Mark Motor Co., 8721 Harkness Rd., Cleveland, Ohio. "Mark."  
Northwestern Storage Battery Co., 140 Mason St., Milwaukee, Wis. "Northwestern." (Batteries.)  
Perfection Igniter Mfg. Co., 1093 Bedford Ave., Brooklyn, N. Y.  
Richardson Engineering Co., 107 Liberty St., N. Y. City. "Richardson."  
★Rose Mfg. Co., 911 Arch St., Phila., Pa. "Neverout."  
Silvey, W. L., Dayton, Ohio. (Batteries.)  
Stecker Electric & Machine Co., Detroit, Mich. "Stecker."  
Terry Engine Co., Bay, 43rd & 44th Sts., Ulmer Park, Brooklyn, N. Y.  
Trebert Gas Engine Co., Butler, Ind.  
Truscott Boat & Auto Supply Co., St. Joseph, Mich.  
Waterman Marine Motor Co., 1506-12 Fort St., W., Detroit, Mich.  
Winter Storage Battery Co., 2959 Indiana Ave., Chicago, Ill. (Batteries.)

# PIERCE

Two  
Speed

Free  
Engine



## Condensed description of Pierce Vibrationless Motorcycles for 1910

### The Four Cylinder

The Pierce four cylinder is the only machine of its kind in the world. Among its numerous superior features are: the four cylinder engine, shaft drive, automatic oiling system, large tubing frame, two speeds, free engine, sliding gear transmission, magneto ignition, simple control and accessibility of all parts. The engine has 7 H. P. and with the two speed gear it is able to climb smoothly any hill that may be encountered.

**Perfect material and Pierce workmanship have combined to make this the most complete and most refined product offered the motorcycling public.**

### The Single Cylinder

The Pierce Single Cylinder motorcycle with its high-powered, long stroke motor, marks a notable innovation in one-cylinder construction. This is a machine which runs with an almost total absence of vibration, and for ordinary city or country use, it has the quiet smooth action for which motorcycles to date have not been noted. But better than all this, it is a machine which climbs the mountain side and does it with the same absence of labor which marks its running on level roads. Always smooth and easy running, always powerful to follow the steepest roadway—what more can be asked? We offer in every detail, the best that "Piercecrafft" affords.

**The following general and special features will appeal to discriminating riders:—**

A motor of 5 H. P. having a long stroke (4") motor equipped with double annular ball-bearings; large tubing frame; magneto ignition; wide flat belt, with free engine effect; Simple grip control.

The Pierce Agency—especially if the Bicycle line is included—offers, in itself, a profitable business for any progressive dealer to engage in. Our proposition, "The Agency that Pays," will be submitted to any dealer in open territory.

*Ask for Catalog "F"*

**The Pierce Cycle Company :: Buffalo, N. Y.**

**PACIFIC COAST BRANCH—Oakland, Cal.**

**BODIES, Metal**

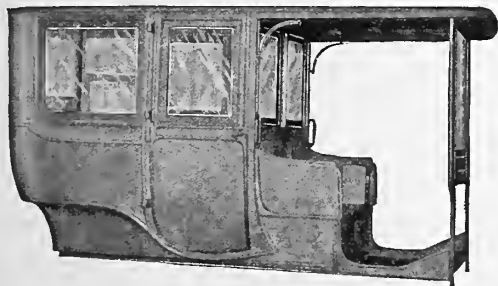
- A-Z Co., The, 527-9 W. 56th St., N. Y. City.  
"A-Z."
- Acme Veneer & Body Co., Rahway, N. J.
- Ahr & Rost Co., 1559-69 Gest St., Cincinnati, Ohio.
- American Body Co., The, 1253-55 Niagara St., Buffalo, N. Y. (Aluminum & steel.)
- Amesbury Metal Body Co., Amesbury, Mass. (Aluminum & steel.)
- Armstrong, The M. Co., 433 Chapel St., New Haven, Conn.
- Auto Body Co., The, Lansing, Mich.
- Auto Body & Taxicab Co., 1648 Broadway, N. Y. City.
- Auto Top & Body Co., 294 N. Watts St., Phila., Pa.
- ★Babcock, H. H. Co., Watertown, N. Y. (Aluminum.)
- Baily, S. E. & Co., Lancaster, Pa. (Aluminum & sheet steel.)
- ★Barndt Johnston Auto Supply Co., The, 408-426 Donaldson St., Columbus, Ohio.
- Berger Mfg. Co., Canton, Ohio. (Steel.)
- Biddle & Smart Co., Amesbury, Mass. (Aluminum & steel.)
- Biehl's Carriage & Wagon Works, 31 S. 5th St., Reading, Pa.
- Blakeslee Vehicle Body & Seat Co., The, Kansas City, Mo.
- Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn.
- Briggs Mfg. Co., Detroit, Mich.
- Broadway Auto Top & Body Co., 136 West 54th St., N. Y. City.
- Burr & Co., 209 W. 48th St., N. Y. City.
- Carriage Woodstock Co., Owensboro, Ky.
- Central Mfg. Co., Connersville, Ind.
- Clark Carriage Co., The, Amesbury, Mass.
- Clayton's Sons, Frank B., 1222-24 Race St., Phila., Pa.
- Cole & Woop, 42-50 W. 67th St., New York, N. Y. (Aluminum.)
- Collings Carriage Co., 1719 Chestnut St., Phila., Pa. (Aluminum & sheet steel.)
- Coyler, J. & Co., 229-35 Halsey St., Newark, N. J.
- Currier-Cameron Co., 85 Elm St., Amesbury, Mass.
- Cutter, J. Frank, 414 Main St., Cambridge, Mass.
- Dayton Body Co., 618-24 Geyer St., Dayton Ohio.
- Delmar Auto Body & Wheel Co., Indianapolis, Ind.
- Demar, J. E. Co., 244-48 W. 49th St., N. Y. City. (Aluminum.)
- Demarest, A. T. Co., 5th Ave. cor. 33rd St., N. Y. City.
- Dunham, D. B. & Co., 128 to 132 Irving St., Rahway, N. J. (Aluminum.)
- Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind.
- Embree-McLean Carriage Co., 1813-23 Olive St., St. Louis, Mo.
- Farnham & Nelson Co., 47 Union Ave., Boston, Mass.
- Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.
- Fisher Body Co., 300-310 Fort St., W. Detroit, Mich.
- Fitzgibbon & Crisp Carriage & Wagon Co., 28-36 Bank St., Trenton, N. J.
- Flandrau & Co., 406-412 Broome St., N. Y. City.
- Fleetwood Metal Body Co., Fleetwood, Pa. "Fleetwood." (Aluminum, aluminoid & steel.)
- Glasscock Bros. Mfg. Co., Muncie, Ind.
- Graves, G. O., Rahway, N. J.
- Graves & Congdon Co., Carriage Ave., Amesbury, Mass.
- Hayes Mfg. Co., Maybury, Grand Avenue & G. T. Ry., Detroit, Mich.
- Holbrook-Singer Co., 509-515 W. 56th St., N. Y. City.
- Howarth & Rogers Co., Oak St., Amesbury, Mass.
- Huron Auto Body Co., Port Huron, Mich.
- Indiana Specialty Works, Pearl & Oak Sts., New Albany, Ind. (Ready to paint.)
- Irvin, R. J. Mfg. Co., 216-22 W. McCarty St., Indianapolis, Ind.
- Judkins, J. B. & Sons Co., Merrimac, Mass. (Aluminum.)
- Keystone Vehicle Co., 500-40 N. 3rd St., Reading, Pa. (Steel & aluminum; to order.)
- ★La Porte Carriage Co., La Porte, Ind. "La Porte."
- Leitch, James N. Co., Amesbury, Mass. (Aluminum & steel.)
- Locke & Co., 218-220 W. 84th St., N. Y. City.
- Loud, Fred A., 55 Stanhope St., Boston, Mass.
- Mammoth Mfg. Co., White Plains, N. Y.
- Michigan Auto Body Co., Milford, Mich.
- Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich. "Detroit." (Steel.)
- Miller Bros., Amesbury, Mass. (Aluminum.)
- Miller, A. J. & Co., Bellefontaine, Ohio.
- Mount, J. W. Co., Maple Ave. & White St., Red Bank, N. J.
- Mulholland Co., Dunkirk, N. Y.
- Mullins, W. H. Co., Salem, Ohio. (Steel.)
- New Britain Sheet Metal Co., New Britain, Conn. (Metal.)
- New Haven Carriage Co., Water & Franklin Sts., New Haven, Conn. (Steel & aluminum.)
- Nichols, D. P. Co., 11 Edgewood St., Roxbury, Mass.
- Page, Samuel K., 60-62 Franklin St., New Haven, Conn.
- Paterson Vehicle Co., 257 Market St., Paterson, N. J.
- Patterson, G. W. Auto Body Co., 1938 Euclid Ave., Cleveland, Ohio.
- Quinby, J. M. & Co., 21-39 Division St., Newark, N. J. (Aluminum.)
- Racine Boat Mfg. Co., Muskegon, Mich.
- Reading Metal Body Co., Fleetwood, Pa.
- Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City.
- Reliance Auto Parts Mfg. Co., 244-50 W. 49th St., N. Y. City. (Aluminum & steel.)
- Schildwacher Carriage Co., Park Ave. & 128th St., New York City.
- ★Schubert Bros. Gear Co., 44 Cedar St., Oneida, N. Y. "Schubert." (Aluminum or sheet steel, in the white or painted & trimmed.)
- Springfield Metal Body Co., 364 Birnie Ave., Springfield, Mass. "Springfield." (Aluminum & steel.)
- Sidney Mfg. Co., The, Sidney, Ohio. (Painted or trimmed.)
- Stratton, C. H. Carriage Co., Muncie, Ind. Stratton."
- Thompson, E. J. Co., 5917-19 Penn Ave., Pittsburgh, Pa. (Aluminum.)
- Union City Body Co., 232½ Columbia St., Union City, Ind.
- Werner, Geo. & Sons, 1133-37 Main St., Buffalo, N. Y.
- Willoughby Co., Utica, N. Y. (To order.)
- Wilson, C. R. Body Co., Detroit, Mich. (In the white or painted and trimmed.)
- Wood, Frederick R. & Son, 217 W. 19th St., N. Y. City.
- York Wagon Gear Co., Belvidere Ave. & P. R. R., York, Pa.
- Young, Wm. Carriage Co., 4521-26 Delmar Ave., St. Louis, Mo. (Aluminum.)
- Zimmermann, F. F. & Sons, Waupun, Wis. "Zimmermann."

**BODIES, Wood**

Abresch, Chas. Co., Fourth & Poplar Sts., Milwaukee, Wis.

**BODIES, Wood—Continued**

- Acme Veneer & Body Co., Rahway, N. J.  
 Ahr & Rost Co., 1559-69 Gest St., Cincinnati, Ohio.  
 American Body Co., The, 1255-63 Niagara St., Buffalo, N. Y.  
 Amesbury Reed & Rattan Co., Bailey Bldg., Amesbury, Mass. (Reed.)  
 Armstrong, The M. Co., 433 Chapel St., New Haven, Conn.  
 Auto Body Co., The, Lansing, Mich.  
 Auto Body & Taxicab Co., 1648 Broadway, N. Y. City.  
 Auto Top & Body Co., 249 N. Watts St., Philadelphia, Pa.  
 Auto Top & Trimming Co., Pontiac, Mich.  
 ★Babcock, H. H. Co., Watertown, N. Y.  
 Baily, S. E. & Co., Lancaster, Pa.  
 ★Barndt Johnston Auto Supply Co., The, 408-426 Donaldson St., Columbus, Ohio.  
 Beaudette, O. J. Co., Pontiac, Mich.  
 Biehl's Carriage & Wagon Works, 31 S. 5th St., Reading, Pa.  
 Blakeslee Vehicle Body & Seat Co., The, Kansas City, Mo.  
 Blue Ribbon Auto & Carriage Co., Cannon St., Bridgeport, Conn.  
 ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.  
 Brewster & Co., Broadway & 47th St., N. Y. City.  
 Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn.  
 Briggs Mfg. Co., Detroit, Mich.  
 Broadway Auto Top & Body Co., 136 West 54th St., N. Y. City.  
 Brunn's Carriage Mfg. Co., 1140-48 Main St., Buffalo, N. Y.  
 Buffalo Auto Body & Trimming Co., 341 Ellicott St., Buffalo, N. Y.  
 Buob & Scheu, Court St. & Broadway, Cincinnati, Ohio.  
 Burr & Co., 209 W. 48th St., N. Y. City.  
 Carlisle Body & Gear Co., Cor. North West & Lincoln Sts., Carlisle, Pa.  
 Carriage Woodstock Co., The, Owensboro, Ky.  
 Central Mfg. Co., Connersville, Ind.  
 Chicago Carriage & Trimming Co., 1908-1912 Indiana Ave., Chicago, Ill.  
 Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.  
 Cincinnati Panel Co., The, Cincinnati, Ohio.  
 Clark Carriage Co., The, Amesbury, Mass.  
 Collins, R. N. Vehicle Woodwork Co., 3900 Chouteau Ave., St. Louis, Mo.  
 Collings Carriage Co., 1719 Chestnut St., Philadelphia, Pa.  
 Cunningham, James, Son & Co., Rochester, N. Y.  
 Currier-Cameron Co., 85 Elm St., Amesbury, Mass.  
 Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn. (In the white.)  
 Dayton Body Co., 618-24 Geyer St., Dayton, Ohio.  
 Delmar Auto Body & Wheel Co., Indianapolis, Ind.  
 Demar, J. E. Co., 244-48 W. 49th St., N. Y. City.  
 Demarest, A. T. Co., 5th Ave., cor. 33rd St., N. Y. City.  
 Denniston, E. E., 184 W. Mohawk St., Buffalo, N. Y.  
 Des Moines Cabinet Co., 403-09 W. S. Ninth St., Des Moines, Iowa.  
 Detroit Carriage Co., Detroit, Mich.  
 Duhamel, H. & Sons, 127-30 Wallabout St., Brooklyn, N. Y.  
 Dunham, D. B. & Co., 128-132 Irving St., Itahway, N. J.  
 Elkhart Carriage Mfg. Co., Elkhart, Ind.  
 Embree-McLean Carriage Co., 1813-23 Olive St., St. Louis, Mo.  
 Everitt, The B. F. Co., 506 Clay Ave., Detroit, Mich.  
 Fickling & Co., Inc., 304-306 W. 49th St., New York, N. Y.  
 Fisher Body Co., 300-310 Fort St., W. Detroit, Mich.  
 Fitzgibbon & Crisp Carriage & Wagon Co., 28-36 Bank St., Trenton, N. J. "Lion."  
 Flandrau & Co., 406-412 Broome St., N. Y. City.  
 Frantz Body Mfg. Co., Akron, Ohio.  
 Fulton & Walker Co., 20th & Filbert Sts., Phila., Pa.  
 Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y. (To order.)  
 Glesenkamp, L., Sons & Co., Pittsburg, Pa.  
 Gould, James Co., Albany, N. Y.  
 Graves, G. O., Rahway, N. J.  
 Graves & Congdon Co., Carriage Ave., Amesbury, Mass.  
 Griswold Motor & Body Co., 660 Commonwealth Ave., Detroit, Mich.  
 Hill Mfg. Co., The, 25-27 Fuller St., Buffalo, N. Y. "Hill."  
 Holbrook-Singer Co., 509-515 W. 56th St., N. Y. City.  
 Holcker-Elberg Mfg. Co., N. E. Cor. 16th & McGee Sts., Kansas City, Mo. "Holcker-Elberg."  
 Hooker, Henry & Co., New Haven, Conn.  
 Howarth & Rogers Co., Oak St., Amesbury, Mass.  
 Hughey, Wm. J. & Son, 1238-40 Michigan Ave., Chicago, Ill.  
 Hume Carriage Co., 66-68 Stanhope St., Boston, Mass.  
 Huron Auto Body Co., Port Huron, Mich.  
 Irvin, R. J. Mfg. Co., 216-22 W. McCarty St., Indianapolis, Ind.  
 Judkins, J. B. & Sons Co., Merrimac, Mass.  
 Kauffman Vehicle Mfg. Co., The, Miamisburg, Ohio. (Finished & trimmed.)  
 Kelsey, Herbert Co., 277-291 Monroe Ave., Detroit, Mich.  
 Keystone Vehicle Co., 500-40 N. 3rd St., Reading, Pa. (To order.)  
 Kilvington, Samuel W., Wilmington, Del.  
 Kimball, C. P. & Co., 315-317 Michigan Ave., Chicago, Ill.  
 Lane, T. W., Amesbury, Mass.



## Automobile Bodies

In Both Aluminum and  
Wood Panels

Limousine, Landaulet, Taxicab and Touring-  
Cars in the white or painted and  
trimmed complete

**ALSO AUTOMOBILE TOPS**

**Schubert Bros. Gear Co., 44 Cedar St., Oneida, N. Y.**

**BODIES, Wood—Continued**

- ★La Porte Carriage Co., La Porte, Ind. "La Porte."  
 Leitch, James N. Co., Amesbury, Mass.  
 Limousine-Carriage Mfg. Co., The, 3515 Michigan Ave., Chicago, Ill.  
 Locke & Co., 218-220 W. 84th St., N. Y. City.  
 Loud, Fred A., 55 Stanhope St., Boston, Mass.  
 Lowell Cutter Co., Lowell, Mich.  
 ★McCue Co., Hartford, Conn. (In the white.)  
 Michigan Auto Body Co., Milford, Mich.  
 Milburn Wagon Co., Toledo, Ohio. (To order.)  
 Miller Bros., Amesbury, Mass.  
 Miller, A. J. & Co., Bellefontaine, Ohio.  
 Monroe Body Co., Pontiac, Mich.  
 Mount, J. W. Co., Maple Ave. & White St., Red Bank, N. J.  
 Mullholland Co., Dunkirk, N. Y.  
 Neustadt Auto Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 New Haven Carriage Co., Water & Franklin Sts., New Haven, Conn.  
 Nichols, D. P. Co., 11 Edgewood St., Roxbury, Mass.  
 Olsen, C. J. & Son, Pittsboro, Ind.  
 Page, Samuel K., 60-62 Franklin St., New Haven, Conn.  
 Paterson Vehicle Co., 257 Market St., Paterson, N. J.  
 Patterson, G. W. Auto Body Co., 1938 Euclid Ave., Cleveland, Ohio.  
 Pease, S. C. & Sons, Merrimac, Mass.  
 Powitsky & Collins Carriage Woodwork Co., St. Louis, Mo.  
 Racine Mfg. Co., Racine, Wis.  
 Racine-Sattley Co., Racine, Wis.  
 Rech-Marbaker Co., 8th & Girard Ave., Phila., Pa.  
 Rothschild & Co., 530-532 W. 27th St., N. Y. City.  
 ★Schubert Bros. Gear Co., 44 Cedar St., Oneida, N. Y. "Schubert." (In the white or painted & trimmed.)  
 Schurmeier Motor Car Co., The, 29 Western Ave., Minneapolis, Minn.  
 Sidney Mfg. Co., The, Sidney, Ohio. (In the white or painted & trimmed.)  
 Sjoberg, J. P. & Co., 533-39 West 32nd St., N. Y. City. (Commercial.)  
 Stevens Mfg. Co., Marinette, Wis.  
 Stone, C. & Sons, 1638-66 Ogden Ave., Chicago, Ill.  
 Stratton, C. H. Carriage Co., Muncie, Ind. "Stratton."  
 Thompson, E. J. Co., 5917-19 Penn Ave., Pittsburgh, Pa.  
 Union City Body Co., 232½ Columbia St., Union City, Ind.  
 Union Wheel Works, rear 157 Frelinghuysen Ave., Newark, N. J.  
 Walker Carriage Co., Merrimac, Mass.  
 Wallis Coach & Carriage Works, 12-14 E. Grant St., Minneapolis, Minn.  
 ★Waverley Co., The, 139 S. East St., Indianapolis, Ind.  
 Wayman & Murphy, Lake & Sangamon Sts., Chicago, Ill.  
 Werner, Geo. & Sons, 1133-37 Main St., Buffalo, N. Y.  
 Willoughby Co., Utica, N. Y. (To order.)  
 Wilson, C. R. Body Co., Detroit, Mich. (In the white or painted & trimmed.)  
 Wood, Frederick R. & Son, 217 W. 19th St., New York, N. Y.  
 York Wagon Gear Co., Belvidere Ave. & P. R. R., York, Pa.  
 Young, Wm. Carriage Co., 4524-26 Delmar Ave., St. Louis, Mo.  
 Zimmermann, F. F. & Sons., Waupun, Wis. "Zimmermann."

**BODY FINISHING**

- American Auto Trimming Co., Fort St. & 4th Ave., Detroit, Mich. (Painting & trimming.)  
 Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. (Upholstering.)  
 Auto Top & Trimming Co., The, Pontiac, Mich. (Repairing.)  
 Briggs Mfg. Co., Detroit, Mich. (Trimming & painting.)  
 Burr & Co., 209 W. 48th St., N. Y. City.  
 Cutter, J. Frank, 414 Main St., Cambridge, Mass. (Upholstering & painting.)  
 Demar, J. E. Co., 244-48 W. 49th St., N. Y. City. (Upholstering & painting.)  
 Dunham, D. B. & Co., 128-132 Irving St., Rahway, N. J. (Retrimming & repainting.)  
 Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind. (Painting and trimming.)  
 Everitt, The B. F. Co., 506 Clay Ave., Detroit, Mich. (Trimming and painting.)  
 Ford Auto Equipment Co., Inc., 735 Michigan Ave., Chicago, Ill. (Painting.)  
 Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y. (Painting & trimming.)  
 Graves & Congdon Co., Carriage Ave., Amesbury, Mass. (Painting & trimming.)  
 Holbrook-Singer Co., 509-515 W. 56th St., N. Y. City. (Painting & upholstering.)  
 Howarth & Rogers Co., Oak St., Amesbury, Mass. (Trimming & painting.)  
 Kelsey, Herbert Co., 277-291 Monroe Ave., Detroit, Mich. (Painting & upholstering.)  
 Kenyon, The R. L. Co., Waukesha, Wis. (Contract upholstery & general cushion work.)  
 Mount, J. W. Co., Maple Ave. & White St., Red Bank, N. J. (Trimming & painting.)  
 Nichols, D. P. Co., 11 Edgewood St., Roxbury, Mass.  
 Paterson Vehicle Co., 257 Market St., Paterson, N. J. (Upholstering and painting.)  
 Pease, S. C. & Sons, Merrimac, Mass. (Painting and upholstering.)  
 Phelps, F. Z. Auto Top & Trimming Co., 1292 Niagara St., Buffalo, N. Y. (Trimming.)  
 Schildwachter Carriage Co., Park Ave. & 128th St., N. Y. City.  
 Standard Auto Top Co., 239 W. 50th St., N. Y. City. (Upholstering.)  
 U. S. Dash & Fender Co., 127 W. 49th St., N. Y. City. (Upholstering.)  
 Vetter Top Co., 49 & 51 W. 66th St., N. Y. City. (Upholstering & painting.)  
 Wallis Coach & Carriage Works, 12-14 E. Grant St., Minneapolis, Minn. (Upholstering & painting.)  
 Werner, Geo. & Sons, 1133-37 Main St., Buffalo, N. Y. (Upholstering.)  
 Young, Wm. Carriage Co., 4524-26 Delmar Ave., St. Louis, Mo. (Painting and repairing.)

**BODY IRONS**

- Columbus Bolt Works, 162 W. Randolph St., Columbus, Ohio.  
 Cortland Forging Co., Cortland, N. Y.  
 Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
 Curry & Abeles, 229 Mulbury St., Newark, N. J.  
 Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich.  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.

## BODY PARTS & FITTINGS

- A-Z Co., The, 527-9 W. 56th St., N. Y. City.  
(Rear deck.)  
American Rattan & Reed Mfg. Co., Kingsland  
& Norman Aves., Brooklyn, N. Y. (Rattan  
seating and moulding.)  
American Veneer Co., 100 Market St., Kenil-  
worth, N. J. (Deck panels for limousines.)  
Briscoe Mfg. Co., 1427-57 Woodward Ave., De-  
troit, Mich. (Deck boxes.)  
Dann Bros. & Co., The, 80-86 Franklin St.,  
New Haven, Conn. (Body & deck panels  
and curved shapes.)  
Empire Panel & Veneer Co., 940 Seneca St.,  
Buffalo, N. Y. (Wood panels & veneers.)  
Hartford Pattern & Model Co., Inc., The, 1,  
124 Allyn St., Hartford, Conn. (Mahog-  
any dash boards.)  
Holland Veneer Works, Holland, Mich. (Wood  
panels.)  
Indiana Specialty Works, Pearl & Oak Sts.,  
New Albany, Ind. (Dash boards & wood  
body parts in knock down shape.)  
Jamestown Panel & Veneer Co., Jamestown,  
N. Y. (Wood panels.)  
★La Porte Carriage Co., La Porte, Ind. "La  
porte." (Wood.)  
Lockwood Co., The, 34 Mechanic St., Newark,  
N. J. (Mouldings.)  
Louisville Veneer Mills, The, 1122-40 Fulton  
St., Louisville, Ky. (Wood panels.)  
Michigan Veneer Co., Alpena, Mich. (Panels  
and veneers.)  
Ohio Scroll & Lumber Co., Covington, Ky.  
(Wood panels.)  
Winchester Lumber Co., Winchester, Ohio.  
(Veneers.)  
Woodman, Joel H., 15th, Clinton & Grand Sts.,  
Hoboken, N. J. (Wood panels & veneers.)

## BODY SOCKETS

Union Forging Co., Union, N. Y.

## BOILERS

- Dieter Steam Engine Co., The, 123 Liberty St.,  
N. Y. City. (Auto & marine.)  
Gas Engine Power Co. & Chas. L. Seabury &  
Co., Morris Heights, N. Y. (Marine.)  
Locke Regulator Co., Salem, Mass. (Auto.)

- Michigan Steam Motor Co., Pike & Garland  
Sts., Pontiac, Mich. (Auto.)  
Neustadt Auto & Supply Co., 3948-50 Olive St.,  
St. Louis, Mo. (Auto.)  
Ofeldt, F. W. & Son, Nyack, N. Y. (Auto.)  
Ofeldt, August & Sons, 123 Liberty St., N. Y.  
City. (Auto.)  
Ontario Iron Works, Pulaski, N. Y. "Safety."  
(Stationary.)  
Portland Garage, Portland, Me. "Stickney."  
(Auto.)  
Steam Carriage Boiler Co., W. First & Al-  
bany Sts., Oswego, N. Y. (Auto.)

## BOILER ALARMS

Steam Carriage Boiler Co., W. First & Al-  
bany Sts., Oswego, N. Y.

## BOILER & RADIATOR COM- POUNDS

- American Oil Co., 170-78 S. Water St., Jack-  
son, Mich.  
Colza Chemical Co., 213 Mutual Life Bldg.,  
Buffalo, N. Y. "Colza."  
Cortland Specialty Co., 176 Railroad St., Cort-  
land, N. Y. "Banner."  
Eagle Lubricating Oil Co., 426-28 First Ave.,  
Pittsburg, Pa.  
Elder Mfg. Co., Indianapolis, Ind. "Radio-  
Cooler." (Compound for removing lime.)  
Field Radiator & Boiler Compound Co., Au-  
burn, Me. "Field" (for stopping leaks in  
boilers & radiators.)  
Globe Boiler Compound Co., Whipple Bldg.,  
Binghamton, N. Y. "Case."  
Hazen-Brown Co., 100 South St., Boston, Mass.  
"R. R. R." (Radiator rust remover.)  
Longhurst, Jas. S., Jr., Lynbrook, L. I., N. Y.  
"Agatite."  
Milwaukee Auto Specialty Co., 134 Second St.,  
Milwaukee, Wis. "Decalcifier."  
Milwaukee Compound Co., Clinton & Oregon  
Sts., Milwaukee, Wis.  
Nautoleak Co., The, Room 601, 112 Water St.,  
Boston, Mass. "Nautoleak."  
New Era Mfg. Co., The, Kalamazoo, Mich.  
"New Era."  
Nonkoroda Co., The, 25 & 27 New Chambers  
St., N. Y. City. "Nonkoroda."  
Northwestern Chemical Co., Marietta, Ohio.  
"Se-Ment-Oil" (for stopping leaks).



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utes. It goes into the leaks, hardening in them so that they are permanently closed. Price,  
\$1.00 per box. By mail, \$1.15. Ask your dealer for it. If he does not keep it, send us  
his name and address, enclosing \$1.15 and a package will be forwarded to you.

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tors. I have used a box of this and will say, It's the Greatest Remedy for Leaky Radia-  
tors I ever saw.

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R. T. KEEN, PRESIDENT.

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**BOILER & RADIATOR COMPOUNDS—Continued**

Schilling, Frederick, 365 Pearl St., N. Y. City. "Paramount."  
 Star Oil Co., 700-08 S. Desplaines St., Chicago, Ill. (Boiler compounds.)  
 Straus Boilerine Co., 55 Broad St., N. Y. City. "Boilerine." (Radiator purifying compound.)  
 Sullivan Oil Co., 413 Wells St., Chicago, Ill.

Randolph-Clowes Co., The, Waterbury, Conn. (Copper.)

★Standard Welding Co., 76th St., N. W., & L. S. & M. S. R. R., Cleveland, Ohio.

**BOILER TUBES**

★National Tube Co., Frick Bldg., Pittsburg, Pa. "Shelby."

**BOILER FEED PUMPS**

(See Pumps, Steam Boiler Feed.)

**BOILER FEED REGULATORS**

Ofeldt, F. W. & Son, Nyack, N. Y.

**BOILER FIXTURES, Automobile**

(See also Water Gauges.)

Beers Bros. Engine Co., Portland Ave. & Norton St., Rochester, N. Y. "Beers." (Thermometers.)

Carey, Philip Mfg. Co., Lockland, O. "Carey's." (Steam pipe & boiler coverings.)

Industrial Instrument Co., Foxboro, Mass. "Standard." (Gauge cocks and safety valves.)

★Johns-Manville, W. H. Co., 100 William St., N. Y. City. (Asbestos boiler covering.)

Locke Regulator Co., Salem, Mass. (Water columns.)

★National Tube Co., Frick Bldg., Pittsburg, Pa. (Water columns.)

New Jersey Asbestos Co., Camden, N. J. "Gladiator" (boiler coverings.)

Ofeldt & Son, F. W., Nyack, N. Y. (Feed water heaters.)

★Ohio Brass Co., Mansfield, O. (To order.)

Penberthy Injector Co., 360 Holden Ave., Detroit, Mich. (Ejectors & injectors.)

Ranlet Automobile Co., St. Johnsbury, Vt. (Feed water heaters.)

Rogers, H. A. Co., 19 John St., N. Y. City. "Moncrieff." (Gauge glasses, imported.)

Schaeffer & Budenberg Mfg. Co., 963-5 Kent Ave., Brooklyn, N. Y. "Durax" & "Compound." (Water gauge glasses.)

Standard Thermometer Co., 65 Shirley St., Boston, Mass. "Standard." (Thermometers.)

Steam Carriage Boiler Co., W. First & Albany Sts., Oswego, N. Y.

Sundberg, J. A. & Co., Kinzie & Carpenter Sts., Chicago, Ill. (Forged steel boiler flanges.)

**BOILER SHELLS**

★Globe Mach. & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, Ohio.

★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. "J. S. & Co."

Pressed Steel Tank Co., West Allis Station, Milwaukee, Wis. (Steel.)

**BOLTS**

(See Nuts and Bolts.)

**BOOTS, Motorists**

Automobile Apparel Co., 14 W. 22nd St., N. Y. City.

Cohen, Frank & Co., 765-771 Stone Ave., Brooklyn, N. Y. (And shoes.)

MacDonald & Campbell, 1334-36 Chestnut St., Phila., Pa. (Lamb's wool lined.)

Parker, John H. Co., 25 James St., Malden, Mass. "Parker's."

Putnam, A. H. Co., Danvers, Mass. "Auto-Felt."

Scandinavian Fur & Leather Co., 16 W. 33rd St., N. Y. City.

**BONNETS**

(See Hoods.)

**BOOTS, Steering Knuckle**

(See Grease Bags.)

**BOUQUET HOLDERS**

(See Limousine Fittings.)

**BOWS, Top**

Brown, S. N. & Co., 107-11 Commercial St., Dayton, Ohio. (Wood.)

Conestoga Bending Works, 547-49 N. Market St., Lancaster, Pa.

Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn.

Downey Bros. Spoke & Bending Co., 240 Harrisburg Ave., Lancaster, Pa.

★ indicates Advertisers—see Index in back of book.

## BOWS, Top—Continued

Empire Bending Works, Lancaster, Pa.  
Gerhab & Ludlain, 305 Cherry St., Phila., Pa.  
Mossman, Yarnelle & Co., Fort Wayne, Ind.  
Roehm & Davidson, Ltd., Detroit, Mich.  
Toledo Carriage Woodwork Co., The, Toledo, Ohio. "Toledo C. W.-W. Co."  
Union Bow Co., 421 Superior Ave., N. W., Cleveland, Ohio.  
Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.

## BOW RESTS

★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.  
Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
Curry & Abeles, 229 Mulberry St., Newark, N. J.  
Decker, J. C., Montgomery, Pa.  
Essex Brass Foundry Co., 141-45 Main St., Cambridge, Mass.  
Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill.  
Globe Brass Works, 15-17 Macomb St., Detroit, Mich.  
★Jonah & George, Merrimac, Mass.  
Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
O'Brien, Jos. F. Co., 63 Park Pl., N. Y. City.  
★Smith, Joseph N. & Co., Fourth & Porter Sts., Detroit, Mich.  
Taylor, H. D. Co., 101-105 Oak St., Buffalo, N. Y.  
Ten Eick, Cornelius, 253 W. 47th St., N. Y. City.  
Woodruff, Walter W. & Sons Co., Mt. Carmel, Conn.

## BOW SEPARATORS

Amesbury Brass & Foundry Co., Amesbury, Mass.  
★Auto Specialties Mfg. Co., Inc., 811-816 Unity Bldg., Chicago, Ill. "Bair."  
Combination Rubber Mfg. Co., Bloomfield, N. J.  
★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.  
Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
Curry & Abeles, 229 Mulberry St., Newark, N. J.  
Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill.  
India Rubber Tire Co., 1461 Michigan Ave., Chicago, Ill.  
Iroquois Auto Top Co., 179-183 Blandina St., Utica, N. Y. "Stick-Tite."  
★Jonah & George, Merrimac, Mass.  
Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
Mattson Rubber Co., 161 Columbus Ave., Lodl, N. J.  
Murphy, The G. W. J. Co., Merrimac, Mass. "Murphy."  
Novelty Mfg. Co., The, Maple St., Waterbury, Conn.  
★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich.  
Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. "Never Rub."  
Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."

Taylor, H. D. Co., 101-105 Oak St., Buffalo, N. Y.  
Ten Eick, Cornelius, 253 W. 47th St., N. Y. City.  
Victor Rubber Co., The, Springfield, Ohio. "Victor."  
Woodruff, Walter W. & Sons Co., Mt. Carmel, Conn.

## BOW SOCKETS

Ashtabula Bow Socket Co., The, Ashtabula, Ohio. (Leather covered & japanned.)  
Cincinnati Bow Socket Co., Cincinnati, Ohio.  
Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O. "Cleveland."  
Cortland Carriage Goods Co., Cortland, N. Y. (Steel & leather covered.)  
★Cortland Forging Co., Cortland, N. Y. "Ajax."  
Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
Detroit, Forging Co., Detroit, Mich.  
Detroit Socket Co., 814 Jefferson Ave., W. Detroit, Mich.  
Gerhab & Ludlain, 305 Cherry St., Phila., Pa.  
Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
Limousine-Carriage Mfg. Co., The, 3515 Michigan Ave., Chicago, Ill. "Beecher."  
★Metal Stamping Co., 30-50 Hubert St., N. Y. City.  
Roehm & Davidson, Ltd., Detroit, Mich. (Leather.)  
Scherer, H. & Co., Detroit, Mich. (Steel and leather covered.)  
Woodruff, The Walter W. & Sons Co., Mt. Carmel, Conn.

## BRAKES, Automobile

Clark, Edward S., 242 Freeport St., Boston, Mass.  
★Cramp, The Wm. & Sons, S. & E. B. Co., Beach and Ball Sts., Phila., Pa. (Shoes.)  
Delaware Hard Fibre Co., Wilmington, Del. (Fibre.)  
★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, O.  
Johnston & Jennings Co., 877 Addison Rd., Cleveland, O.  
Konigslow, Otto, Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.  
★McCue Co., Hartford, Conn. (Complete equipment.)  
Muncie Gear Works, Muncie, Ind. "Muncie."  
National Aluminum & Bronze Co., Indianapolis, Ind. "Davis." (Rubber roller.)  
National Brake & Clutch Co., 16 State St., Boston, Mass. (Cork inserts; Patentees & Licensors.)  
Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
Portland Garage, Portland, Me.  
★Royal Equipment Co., The, 414-32 Housatonic Ave., Bridgeport, Conn. "Raymond" & "Duplex." (Also complete equipments.)  
★Youse & Daddow, 46 N. 5th St., Reading, Pa. "Perfection."

## BRAKES, Cycle

- Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y. "Forsyth Detachable."  
 ★New York Sporting Goods Co., 15-17 Warren St., N. Y. City. "Duck." (Roller.)

## BRAKE BANDS

- Columbia Steel Co., The, Elyria, Ohio.  
 ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Delaware Hard Fibre Co., Wilmington, Del. (Hard fibre.)  
 Emerson, Smith & Co., Ltd., Beaver Falls, Pa. (Steel.)  
 Gandy Belting Co., The, 728-40 W. Pratt St., Baltimore, Md. "Gandy."  
 ★Globe Machine & Stamping Works, 3950 Hamilton Ave., N. E., Cleveland, O.  
 Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.  
 ★McCue Co., Hartford, Conn.  
 ★Mechanical & Electrical Mfg. Co., rear 2227 Prairie Ave., Chicago, Ill.  
 Royal Fibre Co., West Somerville, Mass.  
 ★Royal Equipment Co., The, 414-32 Housatonic Ave., Bridgeport, Conn.  
 ★Standard Welding Co., The, 76th St. N. W., & L. S. & M. S. R. R., Cleveland, O.  
 Williams, I. B. & Sons, Dover, N. H.

## BRAKE DRUMS

- Avery Stamping Co., The, Cleveland, Ohio. "Never-Break."  
 Bossert Co., The, Utica, N. Y. (To order.)  
 Chicago Steel Foundry Company, 19th & Rockwell Sts., Chicago, Ill.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 ★Cullman Wheel Co., 1340 E. Greenwood Terrace, Chicago, Ill.  
 Driggs-Seabury Ordnance Corporation, Sharon, Pa.  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O.  
 ★Hydraulic Pressed Steel Co., The, Cleveland, Ohio.  
 Ireland & Matthews Mfg. Co., Detroit, Mich. "I. & M."  
 ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. "J., S. & Co."  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y.  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
 ★McCue Co., Hartford, Conn.  
 Muncie Gear Works, Muncie Ind. "Muncie." (Rear wheel brake drums & sprockets.)  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 Parish Mfg. Co., 7th & Chestnut Sts., Reading, Pa.  
 ★Royal Equipment Co., The, 414-32 Housatonic Ave., Bridgeport, Conn.  
 ★Smith Co., A. O., Park, Clinton & Virginia Sts., Milwaukee, Wis.  
 ★Sparks-Withington Co., Ltd., The, Jackson, Mich.  
 Stoll Pressed Steel Co., Buffalo, N. Y.

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**BRAKE LEVERS**

(See Levers, Brake.)

**BRAKE LINING**

- Advance Packing & Supply Co., 55 S. Canal St., Chicago, Ill. "Bestallic."
- ★American Belting & Tanning Co., 135 Oliver St., Boston, Mass.
- ★American Bronze Co., Berwyn, Pa. "Non-Gran." (Bronze.)
- Atkins, E. C. & Co., Indianapolis, Ind.
- Auto Parts Mfg. Co., South Elliott St. & T. E. W. R., Muncie, Ind. "B. T. K."
- Calmon Asbestos & Rubber Works of America, 1693 Broadway, N. Y. City. "Ajax."
- ★Empire Tire Co., Trenton, N. J. "Linobestos" & "Embestos."
- ★Johns-Manville, H. W. Co., 100 William St., N. Y. City. "Non-Burn." (Asbestos.)
- Mau-Sherwood Supply Co., 1616 W. Third St., Cleveland, O.
- National Leather Belting Co., 29 Ferry St., N. Y. City.
- New York Leather Belting Co., 51 Beekman St., N. Y. City. "Grip On."
- Rahmann, Geo. & Co., 6 Ferry St., N. Y. City. (Leather for brake bands.)
- Rosendale-Reddaway Belting & Hose Co., Newark, N. J. (Camel hair, stitched canvas & woven cotton.)
- ★Royal Equipment Co., The, 414-32 Housatonic Ave., Bridgeport, Conn.
- ★Thermoid Rubber Co., Trenton, N. J. "Thermoid."
- United & Globe Rubber Mfg. Co., Trenton, N. J. "Safety."
- ★Woven Steel Hose & Rubber Co., Trenton, N. J. "Autobestine."

**BRAKE PEDALS**

(See Pedals, Auto.)

**BRASS CASTINGS**

(See Castings, Brass.)

**BRASS WORK**

(See Special Work.)

**BRAZIER**

(See also Welding.)

- A-Z Co., The, 527-9 W. 56th St., N. Y. City.
- Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, Ohio.
- National Brazing Co., 83 W. Jackson Blvd., Chicago, Ill.

- Paragon Auto-Parts Co., The, 1709-11 Broadway, N. Y. City. (Aluminum.)
- Pittsburg Reinforced Brazing & Machine Co., 2525 Liberty Ave., Pittsburg, Pa.
- Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City.
- ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.
- Vulcan Brazing & Machine Co., 310-312 N. 16th St., Phila., Pa. (Cast iron.)
- Wilhelm, The H. Battery Co., 70-72 Frost St., Brooklyn, N. Y.

**BROADCLOTH**

(See Upholstering Materials.)

**BRONZE CASTINGS**

(See Castings, Bronze.)

**BULBS, Rubber Horn**

- Cincinnati Rubber Mfg. Co., Cincinnati, O.
- ★G & J Tire Co., Indianapolis, Ind.
- ★Nonpareil Horn Mfg. Co., 139-147 Emerson Place, Brooklyn, N. Y. "Nonpareil."
- Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y. "Alpha."
- Pennsylvania Rubber Co., Jeannette, Pa.
- Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J.
- Seamless Rubber Co., New Haven, Conn.
- Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J. "Standard."
- Stevens & Co., 375 Broadway, N. Y. City.

**BUMPERS, Automobile**

- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "McGregor."
- Cisler & Serson, 3111 Michigan Ave., Chicago, Ill. "Hobbs." (Radiator protector.)
- ★Cox Brass Mfg. Co., W. Pearl & Van Woert Sts., Albany, N. Y. "The Cox."
- Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich.
- Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.
- Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill.
- Goodyear Tire & Rubber Co., Akron, O.
- Grossman, Emil Co., 232 W. 58th St., N. Y. City. "Swivelaction."
- Hungerford, U. T., Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."
- Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill.
- Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radium."
- Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill.
- Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson."

**BUMPERS, Automobile—Continued**

- Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. "Aremco."
- ★Sager, J. H. Co., 265 South Ave., Rochester, N. Y. "Protection" & "Ideal."
- ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City. "Atlas."
- Turner Brass Works, Sycamore, Ill. "Harroun."
- ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill.
- ★Victor Auto Supply Mfg. Co., 42 W. 43rd St., N. Y. City. "Vasco."
- Welton Automobile Fender Co., The, 518 Columbus Savings & Trust Bldg., Columbus, O. "Welton."
- Western Brass Manufacturing Works, 21st & Campbell Ave., Chicago, Ill. "Universal."

Mansfield Rubber Co., Mansfield, O. "Mansfield."

Massachusetts Chemical Co., Walpole, Mass.

Mattson Rubber Co., Lodi, N. J.

Mechanical Rubber Co., C. & P. R. R., near Nickel Plate R. R., Cleveland, Ohio. "Cleveland."

★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M. & W."

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.

New York Belting & Packing Co., 91 Chambers St., N. Y. City.

Pennsylvania Rubber Co., Jeannette, Pa.

★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich. (For doors.)

Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."

★Thermoid Rubber Co., Trenton, N. J.

Walpole Rubber Works, Walpole, Mass.

**BUMPERS, Rubber Spring**

- Boston Belting Co., 256-60 Devonshire St., Boston, Mass. "Imperial."
- Bridge Web Tire Co., 2962 Prairie Ave., Chicago, Ill.
- Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Ajax." (Also special.)
- Combination Rubber Mfg. Co., Bloomfield, N. J.
- Continental Rubber Works, Erie, Pa.
- ★Diamond Rubber Co., Akron, Ohio. "Diamond."
- ★G & J Tire Co., Indianapolis, Ind. "G & J."
- ★Goodrich, B. F. Co., Akron, Ohio.
- Hartford Rubber Works Co., 691 Park St., Hartford, Conn. "Hartford."

**BURNERS, Acetylene Lamp**

- Acetylene Gas Illuminating Co., 405 Broome St., N. Y. City.
- American Lava Co., Chattanooga, Tenn. "Alco," "De Luxe," "Hela," "Sunlight" & "No-Name."
- Carroll, J. B., 217 W. Illinois St., Chicago, Ill. "Hahn" & "New Columbia."
- Crane, Wm. M. Co., 1131-1133 Broadway, N. Y. City. "Elta," "Luta" & "Roni"—Bray patent.)

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Crescent Burner Mfg. Co., 339 Broadway, N. Y. City. ("Crescent Victory" and "Crescent Stalit" auto & "Crescent Byke" cycle.)

Drake Acetylene Burner Co., San Jose, Cal. "Drake." (Self-cleaning.)

★Kirchberger, M. & Co., 339 Broadway, N. Y. City. "Von Schwartz."

McCullough, J. H. & Son, 219 N. Broad St., Phila., Pa. "Red Top."

Steward, D. M. Mfg. Co., Chattanooga, Tenn. "Steward's Dolan."

★Wunderbutton Mfg. Co., 242 Lafayette St., N. Y. City. "Wunderbutton."

**BURNERS, Gasoline & Kerosene**

Forg, Peter, 50 Park St., Somerville, Mass. "Forg." (Gasoline.)

Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.

Kelly Handle Bar Co., 5017 Perkins Ave., Cleveland, O. "Kelly." (Gasoline.)

Locke Regulator Co., Salem, Mass. (Gasoline.)

Ofeldt, August, & Sons, 123 Liberty St., N. Y. City. (Kerosene.)

Steam Carriage Boiler Co., W. First & Albany Sts., Oswego, N. Y.

Thomson, Judson L. Mfg. Co., Waltham, Mass. "National." (Kerosene.)

**BURNER CLEANERS**

Barnard Specialty Co., 800 H. W. Hellman Bldg., Los Angeles, Cal. "Barnard."

Carroll, J. B., 217 W. Illinois St., Chicago, Ill. "Columbia."

Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. "Wonder."

Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.

**BURNER PARTS**

Avery Stamping Co., The, Cleveland, Ohio. (Burner pans.)

Kelly Handle Bar Co., 5017 Perkins Ave., Cleveland, O. (Generator and torch combined.)

Locke Regulator Co., Salem, Mass. (Generator.)

Ofeldt & Son, F. W., Nyack, N. Y. (Automatic fuel feed.)

Thomson, Judson L. Mfg. Co., Waltham, Mass.

**BURNER TIPS**

American Lava Co., Chattanooga, Tenn. ("Alco" & "Sunlight" auto, & "Lookout" cycle.)

Crescent Burner Mfg. Co., 339 Broadway, N. Y. City. "Crescent Tiptoptip" & "Crescent America."

★Kirchberger, M. & Co., 339 Broadway, N. Y. City. (Lava.)

**BUSHINGS & PLAIN BEARINGS**

(See Bearings, Plain & Bushings.)

**BY-PASS SCREENS**

Knega Co., The, Inc., Washington, D. C. "Elmore."

**CABLE, Ignition**

(See Ignition Cable.)

**CALCIUM CARBIDE**

(See Carbide.)

**CAMPING OUTFITS**

Abercrombie, D. T. Co., 311 Broadway, N. Y. City. (Auto tents, air beds, air cushions, buckets and camping outfits.)

Abercrombie & Fitch Co., 57 Reade St., N. Y. City.

Alcohol Utilities Co., The, 156 W. 23rd St., N. Y. City. "Pyro."

Barnard Specialty Co., 800 H. W. Hellman Bldg., Los Angeles, Cal. "Barnard." (Combination shovel, pick & hatchet.)

Channon, H. Co., Market & Randolph Sts., Chicago, Ill. (Tents & camp equipment.)

Godfrey, Chas. J. Co., 10 Warren St., N. Y. City. "Auto Camp."

Goshen Eyelet Co., Goshen, Ind. (Auto fireless cookers.)

Hunt Mfg. Co., Lock Box 37, Newark, N. Y. (Sanitary portable refrigerators.)

Pneumatic Mfg. Co., The, 2 & 3 South St., N. Y. City.

Union Furnace Mfg. Co., Union Furnace, Pa. (Auto shovels.)

Wilson, F. Cortez & Son, 239-241 Lake St., Chicago, Ill. "Kamp Kooks Kit." (Cooking outfits.)

Wood Shovel & Tool Co., Piqua, Ohio. "Wood," "Stuart," "Wilson" & "Piqua" (shovels.)

**CANOPIES & SPRAY GUARDS**

Acme Auto Windshield & Top Co., Indianapolis, Ind. (Tops.)

Atkins & Townsend, Felton, Del. (Tops.)

Atlantic Co., The, Amesbury, Mass. (Spray hoods.)

Buob & Scheu, 1408-10 Gilbert Ave., Cincinnati, Ohio. (Tops, boat.)

Chicago Flag & Decorating Co., 350-52 Wabash Ave., Chicago, Ill. (Awnings.)

Columbia Auto Top Co., 17 Dwight St., Springfield, Mass.



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 Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.  
 Flint Auto Top Co., Flint, Mich. (Tops.)  
 Frank, W. H., 22 Harrison St., New Rochelle, N. Y. (Folding cape tops.)  
 Harlow, Willard, Mfg. Co., Janesville, Wis. "Harlow."  
 Hunter-Weckler Boat Co., The, McHenry, Ill. (Canopies.)  
 Irwin Mfg. Co., Galesburg, Ill. "Tip Top." (Sunshades.)  
 Jacobsen, Chas. M., 52 Woodward Ave., Detroit, Mich. (Tops.)  
 Jones & Robinson, City Island, N. Y. "J & R." (Spray hoods.)  
 Kenyon, The R. L. Co., Waukesha, Wis.  
 Lindley, W. H. Co., Main & Canal Sts., Canastota, N. Y. "Lindley" (awnings and spray hoods.)  
 Longdin-Brugger Co., Fond Du Lac, Wis. (Canopies.)  
 McClellan, Chas. P., Fall River, Mass. (Spray hoods.)  
 Peerless Buggy Top Co., S. W. Cor Central Ave. & York St., Cincinnati, Ohio. "Peerless." (Tops.)  
 Pneumatic Mfg. Co., The, 2 & 3 South St., N. Y. City. "Commodore" (spray hoods and guards.)  
 Reynolds, The E. W. Mfg. Co., 1008-10 Jackson St., Omaha, Nebr. (Tops.)  
 Truscott Boat Mfg. Co., St. Joseph, Mich. "Truscott." (Canopies.)  
 Wayne Auto Top Co., 1113 Peach St., Erie, Pa.

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Chicago Drop Forge & Foundry Co., Kensington Station, Chicago, Ill.  
 Driggs-Seabury Ordnance Corporation, Sharon, Pa.  
 Electric Welding Products Co., The, Cleveland, Ohio.  
 Hibbard Engineering Co., 872 Woodward Ave., Detroit, Mich.  
 Johnston & Jennings Co., 877 Addison Rd., Cleveland, Ohio.  
 ★Muskegon Motor Specialties Co., Muskegon, Mich.  
 Obenberger Drop Forge Co., 220-224 Lake St., Milwaukee, Wis.  
 ★Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.  
 Transue & Williams Co., The, Alliance, O.

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★Cortland Forging Co., Cortland, N. Y.  
 ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich.

**CAPS, Motorists**

Automobile Apparel Co., 14 W. 22d St., N. Y. City. (Fur.)  
 Demmerle & Co., 248 W. 23d St., N. Y. City.  
 Forman, Elie & Co., 103 Bedford St., Boston, Mass.

Gilbert Mfg. Co., New Haven, Conn. (Racing bonnets.)  
 Goettler, M., Hat Co., 1260 S. Broadway, St. Louis, Mo. "Goettler." (With goggles combined.)  
 Kaplan, Frank & Dunn, 56 E. 13th St., N. Y. City. "K. F. & D."  
 Lasky & Levy, 756-60 Broadway, N. Y. City.  
 Levine Bros., 105 Bleecker St., N. Y. City. "Circle."  
 Merton, Chas. S. & Co., 810 Broadway, N. Y. City.  
 Revillon Freres, 19 W. 34th St., N. Y. City.  
 Shuman, A. & Co., Washington & Summer Sts., Boston, Mass. (Also hats.)  
 Spear & Co., Woodhaven, N. Y.  
 Spear-Martin Fur Co., 41 Church St., Burlington, Vt. "Spear's Adirondack."  
 Springfield Hat & Cap Co., 31 Taylor St., Springfield, Mass. "Springfield."

**CAPS, Radiator**

(See Radiator Parts.)

**CARBIDE**

Acetylene Gas Illuminating Co., 405 Broome St., N. Y. City. "Candy." (Crude and refined.)  
 American Carbolite Co., 301 N. 55th Ave., Duluth, Minn. (Calcium.)  
 Union Carbide Sales Co., 157 Michigan Ave., Chicago, Ill. (Calcium.)

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National Carbon Co., Lock Drawer L, Cleveland, Ohio.  
 Speer Carbon Co., St. Marys, Pa.

**CARBON CYLINDERS**

National Carbon Co., Lock Drawer L, Cleveland, Ohio.

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 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Carbosolvent."  
 Carbon Remover Co., 108 Fulton St., N. Y. City. "Kilco."  
 Clifton Mfg. Co., Boston, Mass. "Clifton."  
 Detroit Varnish Co., Detroit, Mich. "Rogers."  
 ★Flash Mfg. Co., Zanesville, Ohio. "Flash."  
 French Compression Fluide Co., 62 S. Fair Oaks Ave., Pasadena, Cal. "French Compression Fluide." (Cylinder cleaning compounds.)  
 La France De Carboniser Co., 522 Cleveland Ave., Chicago, Ill. "De Carboniser."  
 Lakewood Chemical Co., 805 Citizens Bldg., Cleveland, Ohio. "Autopower."

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Milwaukee Auto Specialty Co., 131 Second St., Milwaukee, Wis. "Decarbonizer."

National Standard Selling Co., 435-B Produce Exchange, N. Y. City. "Thermody."

Peterson, T. J. Co., Security Bldg., Chicago, Ill. "Solvolute."

★Prest-O-Lite Co., The, 229-237 E. South St., Indianapolis, Ind. "Prest-O-Carbon Remover."

Standard Leather Washer Mfg. Co., 24-26 Boulevard St., Newark, N. J. "Carbo Sol."

Western Chemical Mfg. Co., 208 Fourth St., Milwaukee, Wis. "Owl."

Whitney Chemical Co., 6122 Euclid Ave., Cleveland, Ohio. "Auto Carbon Remover."

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(See also Mixing Valves, Vaporizers and Generator Valves.)

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Bushwick Ave., Brooklyn, N. Y.

★American Die & Tool Co., Reading, Pa.

Backe Commutator Co., 33 Herkimer Place,

Brooklyn, N. Y. "Backe."

Barker, C. L., Norwalk, Conn.

★Beckley-Ralston Co., 80-84 Michigan Ave.,

Chicago, Ill. "Maximus."

Bradley Motor Co., 269 Diamond St., Philadelphia, Pa. "Bradley." (Motorcycle.)

★Breeze Carburetor Co., 240 South St., Newark,

N. J. "Breeze."

★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. "Brennan."

★Brownell, F. A. Motor Co., 634-666 Lexington

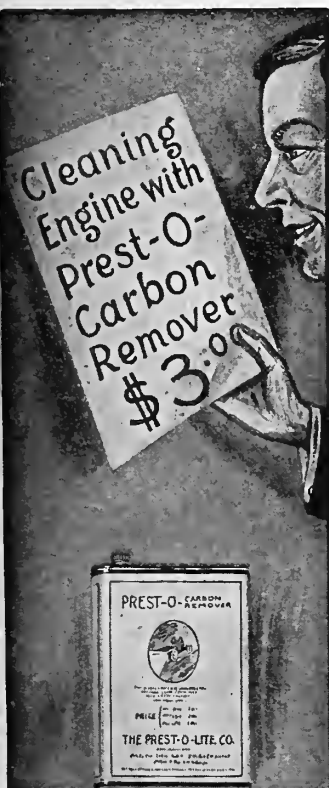
Ave., Rochester, N. Y.

# List of Retail Dealers, Garages, etc., \$25

Our list of garages, repair shops and dealers in automobiles, motorcycles, etc., is the most complete and accurate in existence. It is classified for handy reference and exactly meets the requirements of those who want to circularize the retail trade.

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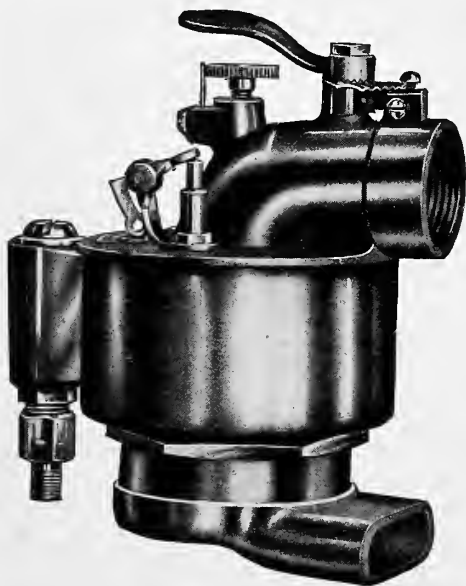
Branches at New York, Boston, Philadelphia, Cleveland, Minneapolis, Omaha, Dallas, Los Angeles and San Francisco.

**CARBURETORS—Continued**

- Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich. "Buffalo."  
 Burdick Motor Car Co., Eau Claire, Wis. "Burdick."  
 Byrne-Kingston & Co., Kokomo, Ind. "Kings-ton."  
 Camden Anchor-Rockland Machine Co., Cam-den, Maine. "Knox."  
 Carter Carburetor Co., 914-18 N. Market St., St. Louis, Mo. "Carter."  
 Carter & Lewis, 41 Westfield Ave., Elizabeth, N. J. "Carter-Lewis."  
 Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."  
 Continental Engine Co., Chicago, Ill.  
 Daley, Walter A., 3520 Melrose Ave., Chicago, Ill.  
 Delaware Machine Works, Wilmington, Del. "Harris."  
 Demster Machinery Co., The, 16th & Walnut Sts., Kansas City, Mo. "Brooke."  
 Derry Mfg. Co., Derry, N. H. "Menns."  
 De Tamble Motors Co., Anderson, Ind. "Speed."  
 Detroit Steering Wheel & Wind Shield Co., 274-288 Wight St., Detroit, Mich. "Galvin."  
 DuBrie Motor Co., 436-442 Guoin St., Detroit, Mich.  
 Duff, R. A. Engineering Co., Nebraska City, Neb.  
 ★Duryea, Chas. E., Reading, Pa. "Duryea."  
 England, Arthur Co., Merrimac, Mass. "Eng-land."  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich. "Essex."  
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 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O. "Ferro."  
 Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill. "Halladay."  
 Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo. (Motorcycle.)  
 Gem Brass & Mfg. Co., 119-21 E. Walnut St., Des Moines, Ia. "Hamilton."  
 Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y. ("Acorn" & "James-Com-pact" auto; "Eclipse" marine.)  
 Gilbert Mfg. Co., New Haven, Conn. "Bow-ers."  
 Hall, Charles E. Co., 106 Broadway, Buffalo, N. Y. "Hall."  
 Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-Man-Co."  
 Heitger Carburetor Co., 205½-207½ West South St., Indianapolis, Ind. "Heitger."  
 Hendricks Novelty Co., 124-128 Capitol Ave., S., Indianapolis, Ind. "Stevenson."  
 Hilaman, A. L. Co., Moorestown, N. J.  
 Holley Bros. Co., 661-673 Beaubien St., De-troit, Mich. "Holley."  
 Hoyt, F. C., 141 Massachusetts Ave., Boston, Mass. "Hoyt."  
 Hydro Carbon Machine Co., The, 431 Bloom-field Ave., Newark, N. J. "Hydro Carbon."  
 Kalamazoo Carburetor Co., Kalamazoo, Mich. "Kalamazoo."  
 Kelly, John, Congress St. & 46th Ave., Chi-cago, Ill. "Kelly."  
 Kemp, J. P., 1618 Ruskin Ave., Baltimore, Md. "Kemp."  
 Kennedy (Ideal) Carburetor Co., The, 179 Clarendon St., Boston, Mass. "Kennedy Ideal."  
 Krice Carburetor Co., Detroit, Mich. "Krice."  
 Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis.  
 Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J.  
 ★Lunkenheimer Co., The, Cincinnati, O. "Non-pareil" (generator valve.)  
 McCanna Mfg. Co., 216 N. Jefferson St., Chi-cago, Ill. "McCanna."

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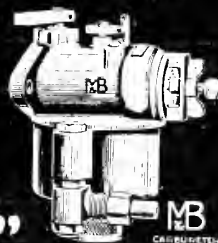
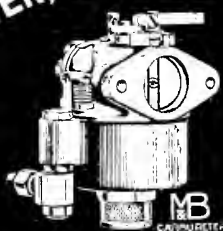
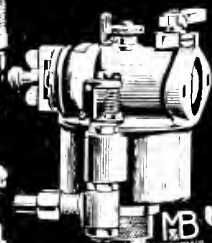
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 Manzel, Charles W., 89-93 Main St., Buffalo, N. Y.  
 Marine Motor Mfg. Co., 5 Park Sq., Boston, Mass.  
 Marvel Carburetor Co., 15½ Virginia St., Indianapolis, Ind. "Marvel."  
 Mayer Carburetor Co., 2673 Main St., Buffalo, N. Y. "Mayer."  
 ★Mechanical & Electrical Mfg. Co., Rear 2227 Prairie Ave., Chicago, Ill.  
 Meyer, A. J., Castle Point, Hoboken, N. J. "Nonpareil."  
 Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis. "Milwaukee."  
 Milwaukee Motor Co., 32nd & Burleigh Sts., Milwaukee, Wis.  
 Monarch Valve Co., 112 Front St., Brooklyn, N. Y.  
 ★Mosler, A. R. & Co., 163 W. 29th St., N. Y. City. "M. & B."  
 Motor Appliance Co. of America, 73 Warren St., New York City. "Bassford."  
 ★Myers, A. J., 244 W. 49th St., N. Y. City. "G & A."  
 Noonan Tool & Machine Works, 103½ and 105 Dominick St., Rome, N. Y.  
 North Chicago Machine Co., The, North Chicago, Ill. "Palmbla."  
 ★Oberdorfer, M. L. Brass Co., 804-806 East Water St., Syracuse, N. Y.  
 Panhard & Levassor, Broadway & 62nd St., N. Y. City. "Krebs." (Imported.)  
 Petre Carburetor Co., The, Cleveland, Ohio.  
 Pixley, Geo. H. Co., 30 Huntington Ave., Boston, Mass. "Pixley."  
 Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill.  
 ★Planhard Mfg. Co., Kokomo, Ind. "Planhard."  
 Pulver, W. D., Salem, N. H. "National."  
 Quincy Brass Works, Inc., The, 130-34 S. Clinton St., Chicago, Ill. (On contract.)  
 Rayfield Mfg. Co., 2224-34 Michigan Ave., Chicago, Ill.  
 Reineking, F. C., 312 Chapel Ave., Jersey City, N. J.  
 ★Reliance Motorcycle Co., Owego, N. Y. (Motorcycle.)  
 Royal Motor Works Co., Worcester, Mass. "Brown & Barlow." (Motorcycle, imported.)  
 ★Schlosser Mfg. Co., 151 East 126th St., N. Y. City.  
 Shain, Chas. D., 70 Murray St., N. Y. City. "Shain's Ball Spray."  
 ★Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y. "Sherwood."  
 Shipman, Ralph, Sunbury, Pa. "Shipman."  
 Siro Carburetor Mfg. Co., 31 Taylor St., Springfield, Mass. "Siro."  
 Steinbrenner & Co., 107 Victoria St., Buffalo, N. Y. "Niagara Spray."  
 Stewart, Alfred C. Machine Works, 1008 Santee St., Los Angeles, Cal. "Stewart Precision."  
 Stromberg Motor-Devices Co., 1253-55 Michigan Ave., Chicago, Ill. "Stromberg."  
 Thrall Motor Co., 35 Fort St., East, Detroit, Mich.  
 Wackenhuth Carburetor Co., 26 Hackett St., Newark, N. J. "Wackenhuth."  
 Waterhouse Co., The, 6 Pelham St., Boston, Mass. "Waterhouse."  
 Watres Mfg. Co., 1133 Broadway, N. Y. City.  
 Wheeler & Schebler, Shelby, Barth & Sanders Sts., Indianapolis, Ind. "Schebler."  
 Wilcox-Bennett Carburetor Co., 1030 Marshall St., N. E., Minneapolis, Minn. "Bennett."  
 Willet Engine & Carburetor Co., The, 764 Ellicott Square, Buffalo, N. Y. "Willet."  
 Williams Carburetor Mfg. Co., The, 963 William St., Buffalo, N. Y. "Williams."

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- American Hard Rubber Co., N. Y. City. (Hard rubber.)  
 Armstrong Cork Co., 23rd St. & Railroad Ave., Pittsburg, Pa. (Cork.)  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Goodwin & Kintz Co., Winsted, Conn.  
 Hercules Float Works, 200 Franklin St., Springfield, Mass. "Hercules" (metal.)  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.  
 Naugatuck Mfg. Co., Naugatuck, Conn. "Naugatuck Seamless." (Seamless copper.)  
 ★Paddock Cork Co., 1209-17 De Kalb Ave., Brooklyn, N. Y. (Cork.)  
 Stokes, Jos. Rubber Co., Trenton, N. J. (Hard rubber.)

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- (See also Priming Devices.)  
 Biederman, C., 1555 Knox St., Cincinnati, O. (Metal.)  
 Carburation Co., The, 825-29 Long Ave., N. W., Cleveland, O. "G-L." (Gasoline economizers.)  
 ★Gasoline Motor Efficiency Co., 1 Exchange Pl., Jersey City, N. J. "Homo." (Fuel economizers.)  
 Goodnow & Blake Mfg. Co., 4th & Porter Sts., Detroit, Mich. (Float chambers.)  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Phoenix." (Gasoline savers.)  
 Lavigne Mfg. Co., Commonwealth Ave. & Railroad, Detroit, Mich. "Lavigne." (Float valves.)  
 New Britain Mfg. Co., New Britain, Conn. (Auxiliary throttle for Schebler carburetor.)  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Parker White Metal & Machine Co., East 10th St., & Phila. & Erie R. R., Erie, Pa. "Parker."  
 Reineking, F. C., 312 Chapel Ave., Jersey City, N. J. (Equalizer.)  
 Ridley, J. S., 1878 Broadway, New York, N. Y. "Peerless." (Fuel Economizer.)

**CARD CASES**

(See Limousine Fittings.)

**CARPET, Coach**

(See Mats.)

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(See Cements, Metal.)

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Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.  
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Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O.  
Akron Brass & Bronze Foundry Co., 10 W. Buchtel Ave., Akron, Ohio.  
Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.

Alloys Foundry Co., Perry & Illinois Sts., Buffalo, N. Y.  
★Aluminum Castings Co., Cleveland, Ohio.  
Aluminum Foundry Co., Manitowoc, Wis.  
American Brass & Aluminum Works, Fulton & East Walnut Sts., Indianapolis, Ind.  
★American Bronze Co., 1415 Niagara St., Buffalo, N. Y.  
American Foundry & Mfg. Co., 11th & Herbert Sts., St. Louis, Mo.  
American Lubricator Co., Detroit, Mich.  
American Motor Castings Co., Detroit, Mich.  
American Pin Co., Waterbury, Conn.  
Arcade Mfg. Co., Freeport, Ill.  
Atlas Brass Foundry Co., 991 Front St., Columbus, Ohio.  
Badger, F. L., (E. Concord), Concord, N. H.  
Brass Foundry & Heating Co., 711-15 S. Adams St., Peoria, Ill.  
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.

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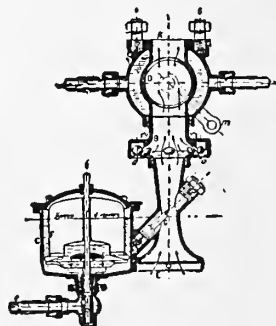
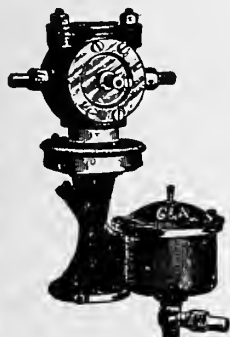
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 Bunting Brass & Bronze Co., Alliance, O.  
 Central Brass & Fixture Co., Springfield, O.  
 Central Machine & Foundry Co., 15th St. & Virginia Ave., Marion, Ind.  
 Challenge Brass Co., 501 Quinpiac Ave., New Haven, Conn.  
 Chicago Hardware Foundry Co., North Chicago, Ill.  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.  
 City Brass Foundry Co., 5310-32 St. Clair Ave., Cleveland, Ohio. "Napoleon."  
 Clayton & Lambert Mfg. Co., Detroit, Mich.  
 Climax Specialty Co., Seneca Falls, N. Y.  
 ★Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.  
 Colonial Brass Co., New Haven, Conn.  
 Craig, J. M., Arch St., Hartford, Conn.  
 ★Cramp, The Wm. & Sons S. & E. B. Co., Beach & Ball Sts., Philadelphia, Pa.  
 D & W Fuse Co., Providence, R. I.  
 Detroit Metal Parts Co., Detroit, Mich.  
 Detroit Motor Castings Co., 299-303 Beaufait Ave., Detroit, Mich.  
 Donovan Foundry Co., 249 R. R. Ave., Bridgeport, Conn.  
 Dorchester Brass & Aluminum Foundry, (Jamaica Plain), Boston, Mass.  
 Eastwood Wire Mfg. Co., Belleville, N. J.  
 Edna Smelting & Refining Co., The, 525-31 Reading Road, Cincinnati, O.  
 Elyria Machine Parts Co., Elyria, Ohio.  
 Enterprise Foundry Co., 1127-57 E. Warren Ave., Detroit, Mich.  
 Fairfield Aluminum Foundry Corporation  
 Fairfield, Conn. "Lion."  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O. "Ferro."  
 Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
 Fore River Ship Building Co., Quincy, Mass.  
 ★Fort Hill Bronze Mfg. Co., 48-56 Waters Ave., West Everett, Mass.  
 Fostoria Aluminum Mfg. Co., The, Fostoria, Ohio.  
 Fowler Brass Works, The, Inc., 2333-35 Wabash Ave., Chicago, Ill.  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Gallagher's, James Sons, 87 Centre St., N. Y. City.  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.  
 Graham, James & Co., 293 Wooster St., New Haven, Conn.  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich.  
 Hardy, Wm. A. & Sons Co., 113 Water St., Fitchburg, Mass.  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."  
 Hercules Float Works, 200 Franklin St., Springfield, Mass. "Hercules."  
 Homer Brass Works, 231 Race St., Phila., Pa.  
 "Hub" Foundry & Plating Co., The, Ossining, N. Y.  
 Ideal Bronze Co., The, 1265 E. 55th St., Cleveland, Ohio.  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 Indiana Auto Parts Co., Marion, Ind.  
 Jefferson Brass Foundry, Brooklyn, N. Y.  
 Keeler Brass Co., Grand Rapids, Mich.  
 Keyless Lock Co., The, Indianapolis, Ind.  
 Levett, Walker M. Co., 464 Tenth Ave., N. Y. City.  
 ★Light Mfg. & Foundry Co., Union & Queen Sts., Pottstown, Pa.  
 Lightning Hose Coupling Co., Winchester, Mass.  
 ★Lunkenheimer Co., The, Cincinnati, Ohio.  
 Mensching Brass Foundry Co., 279 Park St., Milwaukee, Wis.  
 Michigan Aluminum Foundry Co., Post & Jefferson Aves., W., Detroit, Mich.  
 Millett Brass Co., Highland Station, Springfield, Mass.  
 Milwaukee Bronze Castings Co., 119 Clinton St., Milwaukee, Wis.  
 National Aluminum & Bronze Co., Indianapolis, Ind.  
 National Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, Ohio.  
 National Stamping & Electrical Works, 153-59 S. Jefferson St., Chicago, Ill.  
 N. J. Aluminum Co., Newark, N. J.  
 Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.  
 Northern Indiana Brass Co., Elkhart, Ind.  
 ★Oberdorfer, M. L., Brass Co., 804-808 E. Water St., Syracuse, N. Y.  
 Paulson, Thomas & Son, 13 Fulton St., Brooklyn, N. Y.  
 Penn Mfg. Co., Chester, Pa.  
 Phosphor Bronze Smelting Co., Ltd., The, 2200 Washington Ave., Phila., Pa. "Delta Metal."  
 ★Pioneer Brass Works, 418-424 S. Pennsylvania St., Indianapolis, Ind.  
 Portland Foundry & Machine Co., Portland, Ind.  
 Quincy Brass Works, Inc., The, 130-34 S. Clinton St., Chicago, Ill.  
 Racine Brass & Iron Co., Racine, Wis.  
 Reed Mfg. Co., Kalamazoo, Mich.  
 Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa.  
 Reeves Bros. Co., Alliance, Ohio.  
 Rider-Bagg Co., The, 51 Taylor St., Springfield, Mass.  
 Rogers, C. E., 34 Beach St., Boston, Mass.  
 Rostand Mfg. Co., Milford, Conn.  
 Sayre Stamping Co., Sayre, Pa.  
 ★Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.  
 Silver Aluminum Metal Co., 16-20 Steuben St., Brooklyn, N. Y. (Aluminum alloy.)  
 Smith & Wallace, Woburn, Mass.  
 Spencer's, I. S. Sons, Guilford, Conn.  
 Standard Brass Foundry Co., The, Cleveland, Ohio.  
 Standard Brass & Iron Works, 1820 St. Paul Ave., Milwaukee, Wis.  
 Standard Pattern & Mfg. Co., The, Richmond, Ind.  
 Stillman-White Foundry, Bark St., Providence, R. I.  
 Thomas Brass & Iron Co., Waukegan, Ill.  
 Trenton Malleable Iron Co., Trenton, N. J.  
 Turner Brass Works, The, Sycamore, Ill.  
 United Copper Foundry Co., 634 Huntingdon Ave., Boston, Mass.  
 U. S. Aluminum Castings Co., Vandalia Ave., Cincinnati, Ohio.  
 U. S. Bronze Co., Cleveland, Ohio.  
 ★U. S. McAdamite Metal Co., 18-28 Rapelye St., Brooklyn, N. Y.  
 Vanadium Metals Co., Frick Bldg., Pittsburg, Pa. "Victor Vanadium."  
 Victor Metals Co., E. Braintree, Mass.  
 Wagner Mfg. Co., The, Sidney, Ohio.  
 Wambold Mfg. Co., 3009-21 Lisbon Ave., Milwaukee, Wis.  
 Wells Chemical Bronze Works, 219 Summer St., Worcester, Mass.  
 Whitlock Coil Pipe Co., Hartford, Conn.  
 Williams, E. A. & Sons, 76 Montgomery St., Jersey City, N. J.  
 Wilson Mfg. Co., 189 Larned St., W., Detroit, Mich.

★ indicates Advertisers—see Index in back of book.



¶ The North Pole has been discovered. We do not care who discovered it; but, we would like to take a look at the bearings, pretty sure to be Automobile Brand Plastic Bronze, considering their cool running.

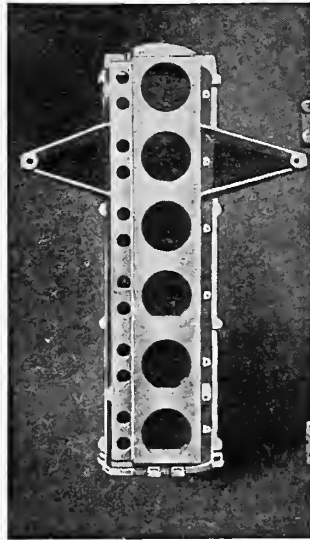


¶ Aeroplanes are flying. Curtiss has beat the lot of them. He used Aerial Brand Aluminum Castings; a New Brand we have just brought out for Flying Machines.

¶ While we spend time and money in developing new alloys suited to new fields of development, we still give our best efforts to our

## Automobile Brand Aluminum and Bronze Castings

¶ These alloys have been developed not by accident, but by knowing the requirements and meeting them.



# Light Mfg. & Foundry Company

Pottstown Pennsylvania

Sales Offices { Real Estate Trust Building, Philadelphia, Pa.  
Westinghouse Building, Pittsburgh

**CASTINGS, Brass**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.
- Adams & Westlake Co., 319 Ontario St., Chicago, Ill.
- Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O.
- Akron Brass & Bronze Foundry Co., 10 W. Buchtel Ave., Akron, Ohio.
- Alloys Foundry Co., Perry & Illinois Sts., Buffalo, N. Y.
- American Brass & Aluminum Works, Fulton & East Walnut Sts., Indianapolis, Ind.
- ★American Bronze Co., 1415 Niagara St., Buffalo, N. Y.
- American Foundry & Mfg. Co., 11th & Herbert Sts., St. Louis, Mo.
- American Manganese Bronze Co., 99 John St., N. Y. City.
- American Motor Castings Co., Detroit, Mich.
- American Pin Co., Waterbury, Conn.
- Amesbury Brass & Foundry Co., Amesbury, Mass.
- Arcade Mfg. Co., Freeport, Ill.
- Atlas Brass Foundry Co., 991 Front St., Columbus, Ohio.
- Badger, F. L. (E. Concord), Concord, N. H.
- Belfield, H. & Co., 435 N. Broad St., Phila., Pa.
- Brass Foundry & Heating Co., 711-15 S. Adams St., Peoria, Ill.
- Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
- Bridgeport Foundry & Machine Co., Bridgeport, Conn.
- Buckeye Iron & Brass Works, 324 E. Third St., Dayton, Ohio.
- Bunting Brass & Bronze Co., Alliance, O.
- Central Brass & Fixture Co., Springfield, O.
- Central Machine & Foundry Co., 15th St. & Virginia Ave., Marion, Ind.
- Challenge Brass Co., 501 Quinncipiac Ave., New Haven, Conn.
- Chicago Hardware Foundry Co., North Chicago, Ill.
- Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.
- City Brass Foundry Co., 5310-32 St. Clair Ave., Cleveland, O. "Napoleon."
- Clark Novelty Co., 380 Exchange St., Rochester, N. Y.
- Clayton & Lambert Mfg. Co., Detroit, Mich.
- Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, O.
- Climax Specialty Co., Seneca Falls, N. Y.
- ★Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.
- Colonial Brass Co., New Haven, Conn.
- ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- Craig, J. M., Arch St., Hartford, Conn.
- ★Cramp, The Wm. & Sons S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- Curry & Abeles, 229 Mulberry St., Newark, N. J.
- D & W Fuse Co., Providence, R. I.
- Detroit Metal Parts Co., Detroit, Mich.
- Detroit Motor Castings Co., 299-303 Beaufait Ave., Detroit, Mich.
- Detroit Sanitary Supply Co., Detroit, Mich.
- Donovan Foundry Co., 249 R. R. Ave., Bridgeport, Conn.
- Dorchester Brass & Aluminum Foundry, (Jamaica Plain), Boston, Mass.
- Eastwood Wire Mfg. Co., Belleville, N. J.
- Edna Smelting & Refining Co., 525-31 Reading Road, Cincinnati, Ohio.
- Elyria Machine Parts Co., Elyria, Ohio.
- Enterprise Foundry Co., 1127-57 E. Warren Ave., Detroit, Mich.
- Essex Brass Foundry Co., 141-45 Main St., Cambridge, Mass.
- Ferro Machine & Foundry Co., 115 Wade Bldg., Cleveland, O. "Ferro."
- Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.
- Fore River Ship Building Co., Quincy, Mass.
- ★Fort Hill Bronze Mfg. Co., 48-56 Waters Ave., West Everett, Mass.
- Fowler Brass Works, Inc., The, 2333-35 Washash Ave., Chicago, Ill.
- Frankel Display Fixture Co., 177 Hudson St., N. Y. City.
- Fries & Co., 91 Main St., Buffalo, N. Y.
- Gallagher's, James Sons, 87 Centre St., N. Y. City.
- Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.
- Graham, James & Co., 293 Wooster St., New Haven, Conn.
- Hall Mfg. Co., John & Gold Sts., N. Y. City.
- ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich.
- Hardy, Wm. A. & Sons Co., 113 Water St., Fitchburg, Mass.
- Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."
- Haydenville Co., The, Haydenville, Mass.
- Hercules Float Works, 200 Franklin St., Springfield, Mass. "Hercules."
- Homer Brass Works, 231 Race St., Phila., Pa.
- "Hub" Foundry & Plating Co., The, Ossining, N. Y.
- Ideal Bronze Co., The, 1265 E. 55th St., Cleveland, Ohio.
- ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.
- Indiana Auto Parts Co., Marion, Ind.
- Ives, The H. B. Co., 11-17 Artizan St., New Haven, Conn.
- Jefferson Brass Foundry, Brooklyn, N. Y.
- Keeler Brass Co., Grand Rapids, Mich.
- Keyless Lock Co., The, Indianapolis, Ind.
- Le Compte Mfg. Co., 119 Chambers St., N. Y. City. "Pope's Island."
- Levett, Walker M. Co., 464 Tenth Ave., N. Y. City.
- Lightning Hose Coupling Co., Winchester, Mass.
- Liquid Carbonic Co., 67 Wells St., Chicago, Ill.
- Lumen Bearing Co., Buffalo, N. Y. "Lumen."
- ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.
- Manlius Motor Co., Manlius, N. Y.
- Mensching Brass Foundry Co., 279 Park St., Milwaukee, Wis.
- Millett Brass Co., Highland Station, Springfield, Mass.
- Milwaukee Bronze Castings Co., 119 Clinton St., Milwaukee, Wis.
- National Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, Ohio.
- National Stamping & Electrical Works, 153-59 S. Jefferson St., Chicago, Ill.
- N. J. Aluminum Co., Newark, N. J.
- New York Brass Foundry, 104 Centre St., N. Y. City.
- Nolte Brass Co., Springfield, Ohio.
- Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.
- Northern Indiana Brass Co., Elkhart, Ind.
- ★Oberdorfer, M. L. Brass Co., 804-808 E. Water St., Syracuse, N. Y.
- ★Ohio Brass Co., Mansfield, O. (To order.)
- Paulson, Thomas & Son, 13 Fulton St., Brooklyn, N. Y.
- Penn Mfg. Co., Chester, Pa.
- Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O.
- ★Pioneer Brass Works, 418-424 S. Pennsylvania St., Indianapolis, Ind.
- Portland Foundry & Machine Co., Portland, Ind.
- Quincy Brass Works, Inc., The, 130-34 S. Clinton St., Chicago, Ill.
- Racine Brass & Iron Co., Racine, Wis.
- Reed Mfg. Co., Kalamazoo, Mich.
- Reeves Bros. Co., Alliance, Ohio.
- Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa. (White brass.)
- Rider-Bagg Co., The, 51 Taylor St., Springfield, Mass.

# THE ALUMINUM CASTINGS CO.

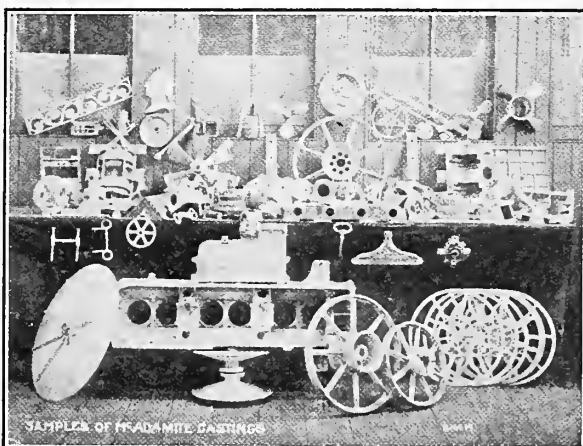
GENERAL OFFICE  
CLEVELAND, OHIO

PLANTS—Cleveland, Detroit, Buffalo, Syracuse  
and New Kensington

## McAdamite

THE STRONGEST  
LIGHT METAL

PATENTED  
NOVEMBER 14TH, 1898  
APRIL - 24TH, 1900  
JULY - 9TH, 1907



## McAdamite

Tension	Compression	Transverse	Torsion	Sp.Gr.
44,250	126,000	87,200	60,300	3.10

SPECIALTY:—Automobile and Aeroplane Castings

UNITED STATES McADAMITE METAL COMPANY  
18-28 RAPELYE STREET :: :: BROOKLYN, NEW YORK

PACIFIC COAST AGENCY—Standard Brass Casting Co., 3d and Franklin Sts., Oakland, Cal.  
ST. LOUIS AGENCY—The Leading Brass & Metal Co., 2713 Hickory St., St. Louis, Mo.

**CASTINGS, Brass—Continued**

Rostand Mfg. Co., Milford, Conn.  
 Rogers, C. E., 34 Beach St., Boston, Mass.  
 Ryan, J. J. & Co., Monroe & Jefferson Sts., Chicago, Ill.  
 Sayre Stamping Co., Sayre, Pa.  
 ★Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.  
 Smith & Wallace, Woburn, Mass.  
 Smith, F. P. Wire & Iron Works, 100-02 Lake St., Chicago, Ill.  
 Standard Brass Foundry Co., The, Cleveland, Ohio.  
 Standard Brass & Iron Works, 1820 St. Paul Ave., Milwaukee, Wis.  
 Standard Pattern & Mfg. Co., The, Richmond, Ind.  
 Stephens, Roe Mfg. Co., Detroit, Mich.  
 Stillman-White Foundry, Bark St., Providence, R. I.  
 Syracuse Aluminum & Bronze Co., The, 530 Leavenworth Ave., Syracuse, N. Y.  
 Thomas Brass & Iron Co., Waukegan, Ill.  
 ★Toffer, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.  
 Trenton Malleable Iron Co., The, Trenton, N. J.  
 Triumph Electric Co., Cincinnati, O.  
 Turner Brass Works, The, Sycamore, Ill.  
 Turner & Seymour Mfg. Co., Torrington, Conn.  
 United Copper Foundry Co., 634 Huntington Ave., Boston, Mass.  
 U. S. Aluminum Castings Co., Vandalia Ave., Cincinnati, O.  
 U. S. Bronze Co., Cleveland, Ohio.  
 Vanadium Metals Co., Frick Bldg., Pittsburgh, Pa. "Victor Vanadium."  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."  
 Victor Metals Co., E. Braintree, Mass.  
 Wambold Mfg. Co., 3009-21 Lisbon Ave., Milwaukee, Wis.  
 Waterbury Mfg. Co., Waterbury, Conn.  
 Wells Chemical Bronze Works, 219 Summer St., Worcester, Mass.  
 Whitlock Coil Pipe Co., The, Hartford, Conn.  
 Wilcox-Crittenden & Co., Middletown, Conn.  
 Williams, E. A. & Sons, 76 Montgomery St., Jersey City, N. J.  
 Wilson Mfg. Co., 189 Larned St., W., Detroit, Mich.  
 Woodruff, Walter W. & Sons Co., Mount Carmel, Conn.

**CASTINGS, Bronze**

Adams & Westlake Co., 319 Ontario St., Chicago, Ill.  
 Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O.  
 Akron Brass & Bronze Foundry Co., 10 W. Buchtel Ave., Akron, Ohio.  
 Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.  
 Alloys Foundry Co., Perry & Illinois Sts., Buffalo, N. Y.  
 ★Aluminum Castings Co., Cleveland, Ohio.  
 American Brass & Aluminum Works, Fulton & East Walnut Sts., Indianapolis, Ind.  
 ★American Bronze Co., 1415 Niagara St., Buffalo, N. Y.  
 American Foundry & Mfg. Co., 11th & Herbert Sts., St. Louis, Mo.  
 American Lubricator Co., Detroit, Mich.  
 American Manganese Bronze Co., 99 John St., N. Y. City.  
 American Motor Castings Co., Detroit, Mich.  
 American Pin Co., Waterbury, Conn.

Amesbury Brass & Foundry Co., Amesbury, Mass.  
 Atlas Brass Foundry Co., 991 Front St., Columbus, Ohio.  
 Badger, F. L. (E. Concord), Concord, N. H.  
 Belfield, H. & Co., 435 N. Broad St., Phila., Pa.  
 Brass Foundry & Heating Co., 711-15 S. Adams St., Peoria, Ill.  
 Bridgeport's Deoxidized Bronze & Metal Co., Bridgeport, Conn.  
 Bridgeport Foundry & Machine Co., Bridgeport, Conn.  
 Buckeye Iron & Brass Works, 324 E. Third St., Dayton, Ohio.  
 Bunting Brass & Bronze Co., Alliance, O.  
 Central Brass & Fixture Co., The, Springfield, O.  
 Central Machine & Foundry Co., 15th St. & Virginia Ave., Marion, Ind.  
 Challenge Brass Co., 501 Quinpiac Ave., New Haven, Conn.  
 Chicago Hardware Foundry Co., North Chicago, Ill.  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.  
 City Brass Foundry Co., 5310-32 St. Clair Ave., Cleveland, O. "Napoleon."  
 Clayton & Lambert Mfg. Co., Detroit, Mich.  
 ★Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.  
 Colonial Brass Co., New Haven, Conn.  
 Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y. "Columbian." (Manganese bronze, marine.)  
 Craig, J. M., Arch St., Hartford, Conn.  
 ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 D & W Fuse Co., Providence, R. I.  
 Detroit Metal Parts Co., Detroit, Mich.  
 Detroit Motor Castings Co., 299-303 Beaufait Ave., Detroit, Mich.  
 Donovan Foundry Co., 249 R. R. Ave., Bridgeport, Conn.  
 Dorchester Brass & Aluminum Foundry, (Jamaica Plain), Boston, Mass.  
 Eastwood Wire Mfg. Co., Belleville, N. J.  
 Edna Smelting & Refining Co., The, 525-31 Reading Road, Cincinnati, Ohio.  
 Elevator Supply & Repair Co., 119 S. Jefferson Ave., Chicago, Ill.  
 Elkhart Brass Mfg. Co., 908 Prospect St., Elkhart, Ind.  
 Elyria Machine Parts Co., Elyria, Ohio.  
 Enterprise Foundry Co., 1127-57 E. Warren Ave., Detroit, Mich.  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, Ohio. "Ferro."  
 Findelsen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
 Fore River Ship Bldg. Co., Quincy, Mass.  
 ★Fort Hill Bronze Mfg. Co., 48-56 Waters Ave., West Everett, Mass.  
 Fowler Brass Works, The, Inc., 2333-35 Wabash Ave., Chicago, Ill.  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Gallagher's, James Sons, 87 Centre St., N. Y. City.  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.  
 Graham, James & Co., 293 Wooster St., New Haven, Conn.  
 Hall Mfg. Co., John & Gold Sts., N. Y. City.  
 Hardy, Wm. A. & Sons Co., 113 Water St., Fitchburg, Mass.  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."  
 Haydenville Co., The, Haydenville, Mass.  
 Hercules Float Works, 200 Franklin St., Springfield, Mass. "Hercules."  
 Homer Brass Works, 231 Race St., Phila., Pa.  
 "Hub" Foundry & Plating Co., The, Ossining, N. Y.  
 Ideal Bronze Co., The, 1265 E. 55th St., Cleveland, Ohio.

★ indicates Advertisers—see Index in back of book.



# Shocks and Strains

On automobile machinery  
are tremendous

---

Light construction is desirable.

Reputations of makers are at stake.

Lives of users are at stake.

There seems, therefore, no place for metals of inferior strength, such as malleable iron (malleable steel) or semi-steel.

There is no casting of greater strength than the steel castings that we manufacture.

---

**Michigan Crucible Steel Castings Co.**

DETROIT, MICHIGAN

**CASTINGS, Bronze—Continued**

- ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.
- Indiana Auto Parts Co., Marion, Ind.
- Ives, The H. B. Co., 11-17 Artizan St., New Haven, Conn.
- Jefferson Brass Foundry, Brooklyn, N. Y.
- Keeler Brass Co., Grand Rapids, Mich.
- Keyless Lock Co., The, Indianapolis, Ind.
- Le Compte Mfg. Co., 119 Chambers St., N. Y. City. "Pope's Island."
- Levett, Walker M. Co., 464 Tenth Ave., N. Y. City.
- ★Light Mfg. & Foundry Co., Union & Queen Sts., Pottstown, Pa.
- Lightning Hose Coupling Co., Winchester, Mass.
- Lumen Bearing Co., Buffalo, N. Y. "Lumen."
- ★Lunkenheimer Co., The, Cincinnati, Ohio.
- Manlius Motor Co., Manlius, N. Y.
- Mensching Brass Foundry Co., 279 Park St., Milwaukee, Wis.
- Michigan Aluminum Foundry Co., Post & Jefferson Aves., W., Detroit, Mich.
- Millett Brass Co., Highland Station, Springfield, Mass.
- Milwaukee Bronze Castings Co., 119 Clinton St., Milwaukee, Wis.
- National Aluminum & Bronze Co., Indianapolis, Ind.
- National Bronze & Aluminum Foundry Co., 2539 E. 79th St., Cleveland, Ohio.
- National Stamping & Electric Works, 153-53 S. Jefferson St., Chicago, Ill.
- N. J. Aluminum Co., Newark, N. J.
- Nolte Brass Co., Springfield, Ohio.
- Non-Corrosive Metal Co., Inc., Watertown, Mass. "N C."
- Noonan Tool & Machine Works, 103½ and 105 Dominick St., Rome, N. Y.
- Northern Indiana Brass Co., Elkhart, Ind.
- ★Oberdorfer, M. L. Brass Co., 804-808 E. Water St., Syracuse, N. Y.
- ★Ohio Brass Co., Mansfield, O. (To order.)
- Paulson, Thomas & Son, 13 Fulton St., Brooklyn, N. Y. (Phosphor & Manganese.)
- Penn Mfg. Co., Chester, Pa.
- Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O.
- Phosphor Bronze Smelting Co., Ltd., The, 2200 Washington Ave., Phila., Pa. "Elephant Brand."
- ★Pioneer Brass Works, 418-424 S. Pennsylvania St., Indianapolis, Ind.
- Portland Foundry & Machine Co., Portland, Ind.
- Reeves Bros. Co., Alliance, Ohio.
- Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa. (Manganese.)
- Rider-Bagg Co., The, 51 Taylor St., Springfield, Mass.
- Rogers, C. E., 34 Beach St., Boston, Mass.
- Rostand Mfg. Co., Milford, Conn.
- Sayre Stamping Co., Sayre, Pa.
- ★Shewood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
- Smith & Wallace, Woburn, Mass.
- Spencer's, I. S. Sons, Guilford, Conn.
- Standard Brass Foundry Co., The, Cleveland, Ohio.
- Standard Brass & Iron Works, 1820 St. Paul Ave., Milwaukee, Wis.
- Standard Pattern & Mfg. Co., The, Richmond, Ind.
- Stillman-White Foundry, Bark St., Providence, R. I.
- Thomas Brass & Iron Co., Waukegan, Ill.
- ★Toffler Co., S., Inc., 145th St. & Southern Blvd., N. Y. City.
- Trenton Malleable Iron Co., The, Trenton, N. J.
- Triumph Electric Co., Cincinnati, O.
- Turner Brass Works, The, Sycamore, Ill.
- Turner & Seymour Mfg. Co., Torrington, Conn.
- United Copper Foundry Co., 634 Huntington Ave., Boston, Mass.
- U. S. Aluminum Castings Co., Vandalia Ave.,

- Cincinnati, Ohio.
- U. S. Bronze Co., Cleveland, Ohio.
- Vanadium Metals Co., Frick Bldg., Pittsburg, Pa. "Victor Vanadium."
- Victor Metals Co., E. Braintree, Mass.
- Wambold Mfg. Co., 3009-21 Lisbon Ave., Milwaukee, Wis.
- Wells Chemical Bronze Works, 219 Summer St., Worcester, Mass.
- Whitlock Coil Pipe Co., The, Hartford, Conn.
- Williams, E. A. & Son, 76 Montgomery St., Jersey City, N. J.
- Wilson Mfg. Co., 189 Larned St., W., Detroit, Mich.
- Woodruff, Walter W. & Sons Co., Mt. Carmel, Conn.

**CASTINGS, Composition**

- Amesbury Brass & Foundry Co., Amesbury, Mass.
- ★Cramp, The, Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- ★Doehler Die Casting Co., 187 W. 9th St., Brooklyn, N. Y. "Doehler." (Finished.)
- Hall Mfg. Co., John & Gold Sts., N. Y. City.
- Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."
- Haydenville Co., The, Haydenville, Mass.
- "Hub" Foundry & Plating Co., The, Ossining, N. Y.
- Ives, The H. B. Co., 11-17 Artizan St., New Haven, Conn.
- Levett, Walker M. Co., 464 Tenth Ave., N. Y. City.
- ★Light Mfg. & Foundry Co., Union & Queen Sts., Pottstown, Pa. (Babbitt.)
- Millett Brass Co., Highland Station, Springfield, Mass.
- N. J. Aluminum Co., Newark, N. J.
- Non-Corrosive Metal Co., Inc., Watertown, Mass. "N C" (rustless nickel.)
- Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.
- Oakley Steel Foundry Co., Millbury, Mass. (Monel metal.)
- ★Ohio Brass Co., Mansfield, O. (To order.)
- Orford Copper Co., The, 43 Exchange Place, N. Y. City. "Monel Metal."
- Paulson, Thomas & Son, 13 Fulton St., Brooklyn, N. Y.
- Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa.
- Turner & Seymour Mfg. Co., Torrington, Conn.
- Veeder Mfg. Co., Hartford, Conn. "Veeder Metal." (Fine.)
- Wells Chemical Bronze Works, 219 Summer St., Worcester, Mass.

**CASTINGS, Die**

- American Die Casting Co., Indianapolis, Ind.
- Bay State Screw Co., Hatfield, Mass.
- ★Doehler Die Casting Co., 187 W. 9th St., Brooklyn, N. Y. "Doehler." (Finished.)
- Finished Parts Mfg. Co., 68 Orchard St., Newark, N. J.
- ★Fort Hill Bronze Mfg. Co., 48-56 Waters Ave., West Everett, Mass.

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**CASTINGS, Die—Continued**

Franklin, H. H. Mfg. Co., Automobile Dept.,  
402 Geddes St., Syracuse, N. Y. "Frank-  
lin."  
Hoyt Metal Co., Merchants' LaCade Bldg.,  
St. Louis, Mo.  
Lumen Bearing Co., Buffalo, N. Y.  
Moberg, C. J., 201-207 N. 6th Ave., Mt. Ver-  
non, N. Y. (White bronze.)  
Mogul Metal Co., 149-151 Larned St., Detroit,  
Mich. "Mogul."  
Muzzy-Lyon Co., Ltd. (See Mogul Metal Co.)  
Parker White Metal & Machine Co., East 10th  
St. & Phila. & Erie R. R., Erie, Pa.  
★Spacke, F. W. Machine Co., The, Madison  
Ave., Merrill & Penn Sts., Indianapolis,  
Ind.  
Stroh Die Moulded Casting Co., Milwaukee,  
Wis.  
Syracuse Die Moulded Casting Co., Syracuse,  
N. Y.  
Wetherill Finished Castings Co., Erie Ave.,  
East of Richmond St., Phila., Pa.

**CASTINGS, Grey Iron**

(See also Engine Sets & Malleable Iron  
Castings.)  
Acorn Brass Mfg. Co., 227 N. Peoria St., Chi-  
cago, Ill.  
American Foundry & Mfg. Co., 11th & Her-  
bert St., St. Louis, Mo. (Cylinder.)  
American Motor Castings Co., Detroit, Mich.  
Arnold Co., Inc., The, Norwalk, Conn.  
Baird Machine & Mfg. Co., 11-23 Raynor St.,  
Detroit, Mich. (Engine.)  
Barbour-Stockwell Co., Cambridgeport, Mass.

Barcus, Geo. & Co., Wabash, Ind.  
Bayview Foundry Co., Shelby & Water Sts.,  
Sandusky, O.  
Belle City Mfg. Co., Box D., Racine Junction,  
Wis.  
Brown & Sharpe Mfg. Co., Providence, R. I.  
Buffalo Co-Operative Stove Co., Buffalo, N. Y.  
Buffalo Foundry & Machine Co., Buffalo,  
N. Y.  
Capitol Foundry Co., The, Hartford, Conn.  
Central Machine & Foundry Co., 15th St. &  
Virginia Ave., Marion, Ind.  
Challenge Machinery Co., The, Grand Haven,  
Mich. "Challenge."  
Chicago Hardware Foundry Co., North Chi-  
cago, Ill.  
Columbia Machine Works & M. I. Co., At-  
lantic Ave. & Chestnut St., Brooklyn,  
N. Y.  
★Dopp, H. W. Co., Buffalo, N. Y.  
Driesbach, C. A. Foundry & Machine Co., 25  
Poplar St., Cor. River St., New Haven,  
Conn.  
Eagle Co., The, 98 Warren St., Newark, N. J.  
Elevator Supply & Repair Co., 119 S. Jef-  
ferson Ave., Chicago, Ill.  
Empire Foundry Co., New Brunswick, N. J.  
Ensign Foundry Co., Toledo, Ohio.  
Enterprise Foundry Co., 1127-57 E. Warren  
Ave., Detroit, Mich.  
Erie Foundry Co., Erie, Pa.  
Fairbanks Co., Springfield, Mass.  
Ferro Machine & Foundry Co., The, 115 Wade  
Bldg., Cleveland, O.  
Flagg, Stanley G. & Co., Phila., Pa.  
Fore River Ship Building Co., Quincy, Mass.  
Frontier Iron Works, Buffalo, N. Y. (Cyl-  
inder.)  
Fulton Foundry & Machine Co., 21 Furman  
St., Brooklyn, N. Y.  
Gardner Motor Co., The, 5143 Delmar Blvd.,  
St. Louis, Mo.

# DIE-CASTINGS

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## DIE-CAST BEARINGS

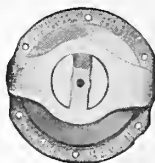
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 General Foundry & Machine Co., Belden Ave. & Sand St., Syracuse, N. Y.  
 Grey Iron Castings Co., Mt. Joy, Pa.  
 Hall Gas Engine Mfg. Co., Byesville, Ohio.  
 Hart Foundry Co., 12 Allen St., Lawrence, Mass. (Engine.)  
 Hilles & Jones Co., Wilmington, Del.  
 Holyoke Motor Foundry Co., Holyoke, Mass.  
 Howard Iron Works, Buffalo, N. Y.  
 Interstate Foundry Co., The, Cleveland, O.  
 Jones, W. A. Foundry & Machine Co., North Ave. & Noble St., Chicago, Ill.  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y. (Engine, crank, gear & fly-wheel cases.)  
 Kelly, Edward, Foundry Co., 2000 S. Main St., Elkhart, Ind.  
 Lovewell-Henrich Co., 928 Broadway, Chelsea, Mass.  
 Manlius Motor Co., Manlius, N. Y.  
 Manufacturers' Foundry Co., The, Waterbury, Conn. (To order.)  
 Manville Bros. Co., Waterbury, Conn. (Cylinders.)  
 Massey Machine Co., 103 Pearl St., Watertown, N. Y.  
 Merrell Mfg. Co., The, Toledo, O.  
 Michigan Motor Casting Co., Flint, Mich.  
 Mohn & Kershner, Cor. Green & Tulpehocken Sts., Reading, Pa.  
 Monarch Foundry Co., 895-907 Greenwood Ave., Detroit, Mich.  
 Morse Iron Works, Erie, Pa.  
 Muncie Foundry & Machine Co., Muncie, Ind. (Cylinder.)  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 Nortmann-Duffke Foundry Co., Layton Ave., 26th to 27th, Milwaukee, Wis.  
 Peerless Foundry Co., Hamilton, O.  
 Penn Mfg. Co., Chester, Pa.  
 Pequonnock Foundry, Inc., Bridgeport, Conn.  
 Portland Foundry & Machine Co., Portland, Ind.  
 Pratt Foundry Co., Campello, Mass. (Marine engine.)  
 Racine Iron & Engine Co., Racine, Wis.  
 Reliance Iron & Engine Co., Racine, Wis. (Cylinder.)  
 Rock Island Mfg. Co., Rock Island, Ill. "Rock Island."  
 Schaefer Mfg. Co., Berlin, Wis.  
 Sintz-Wallen Co., Grand Rapids, Mich.  
 Smith & Wallace, Woburn, Mass.  
 Smith, F. P. Wire & Iron Works, 100-02 Lake St., Chicago, Ill.  
 Stephens, Roe Mfg. Co., Detroit, Mich.  
 Stowell Mfg. & Foundry Co., S. Milwaukee, Wis.  
 Tallmadge, J., Baldwinville, N. Y. (Marine engine.)  
 Turner & Seymour Mfg. Co., Torrington, Conn.  
 ★Unlon Mfg. Co., New Britain, Conn.  
 Wagner Mfg. Co., The, Sidney, Ohio.  
 Walker Foundry Co., Erie, Pa.  
 Waterbury Castings Co., R. R. Hill, Waterbury, Conn.

**CASTINGS, Malleable Iron**

Acme Steel & Malleable Iron Works, 245 Military Rd., Buffalo, N. Y.  
 Buhl Malleable Co., Wight & Adair Sts., Detroit, Mich.  
 Chisholm & Moore Mfg. Co., The, Cleveland, Ohio.  
 Columbus Malleable Casting Co., The, 770

Jefferson Place, Columbus, Ohio. "CM" & "Steiro."  
 Erie Malleable Iron Co., Erie, Pa.  
 Flagg, Stanley G. & Co., Phila., Pa.  
 Frazer & Jones Co., Syracuse, N. Y.  
 Globo Malleable Iron Co., Syracuse, N. Y.  
 Illinois Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill.  
 ★Janney, Steinmetz & Co., Cor. 4th & Market Sts., Phila., Pa.  
 Keeler Brass Co., Grand Rapids, Mich.  
 Malleable Iron Fittings Co., Branford, Conn.  
 Moline Malleable Iron Co., St. Charles, Ill.  
 Morse Iron Works, Erie, Pa.  
 Naugatuck Malleable Iron Co., Naugatuck, Conn.  
 Ohio Malleable Iron Co., The, Columbus, O.  
 Oriskany Malleable Iron Co., Oriskany, N. Y.  
 Penn Mfg. Co., Chester, Pa.  
 Pratt, Wm. E. Mfg. Co., 91 Lake St., Chicago, Ill.  
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.  
 Syracuse Malleable Iron Works, 121 S. Geddes St., Syracuse, N. Y.  
 Terre Haute Malleable & Mfg. Co., Terre Haute, Ind.  
 Trenton Malleable Iron Co., The, Trenton, N. J.  
 Vulcan Iron Works, The, New Britain, Conn. (To order.)  
 Wilmington Malleable Iron Co., Wilmington, Del.  
 Woodruff, The Walter W. & Sons Co., Mt. Carmel, Conn.

**CASTINGS, Steel**

Acme Steel & Malleable Iron Works, 245 Military Rd., Buffalo, N. Y.  
 ★Adrian Steel Castings Co., Adrian, Mich. (Crucible.)  
 American Motor Castings Co., Detroit, Mich. (Semi-steel.)  
 Buffalo Foundry & Machine Co., Buffalo, N. Y. (Semi-steel.)  
 Buhl Malleable Co., Wight & Adair Sts., Detroit, Mich. (Malleable.)  
 Chester Steel Castings Co., Chester, Pa.  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Crucible.)  
 Crucible Steel Casting Co., Lansdowne, Pa. (Crucible & vanadium.)  
 Damascus Crucible Steel Casting Co., New Brighton, Pa. (Crucible.)  
 Eastern Steel Castings Co., 696 E. First St., S. Boston, Mass. (Crucible.)  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.  
 Flagg, Stanley G. & Co., Phila., Pa.  
 Gerlinger Steel Casting Co., 59th St. & National Ave., W. Allis, Wis.  
 Inland Steel Castings Co., Terre Haute, Ind.  
 Johnson, Isaac G. & Co., Spuyten Duyvil, N. Y. City.  
 ★Keystone Steel Castings Co., Chester, Pa. "Keystone." (Crucible & machinery steel.)  
 Krupp, (Thos. Prosser & Son), P. O. Box 878, G. P. O., N. Y. City.  
 ★Lebanon Steel Casting Co., Lebanon, Pa.  
 Maynard Steel Foundry Co., 710-16 Reed St., Milwaukee, Wis. (Crucible & vanadium.)  
 Malleable Iron Fitting Co., Branford, Conn.  
 ★Michigan Crucible Steel Castings Co., Detroit, Mich. (Crucible.)  
 Milwaukee Steel Foundry Co., Milwaukee, Wis.  
 Naugatuck Malleable Iron Co., Naugatuck, Conn. (Semi-steel.)  
 New Process Steel Co., The, 210 W. River St., Marshall, Mich.

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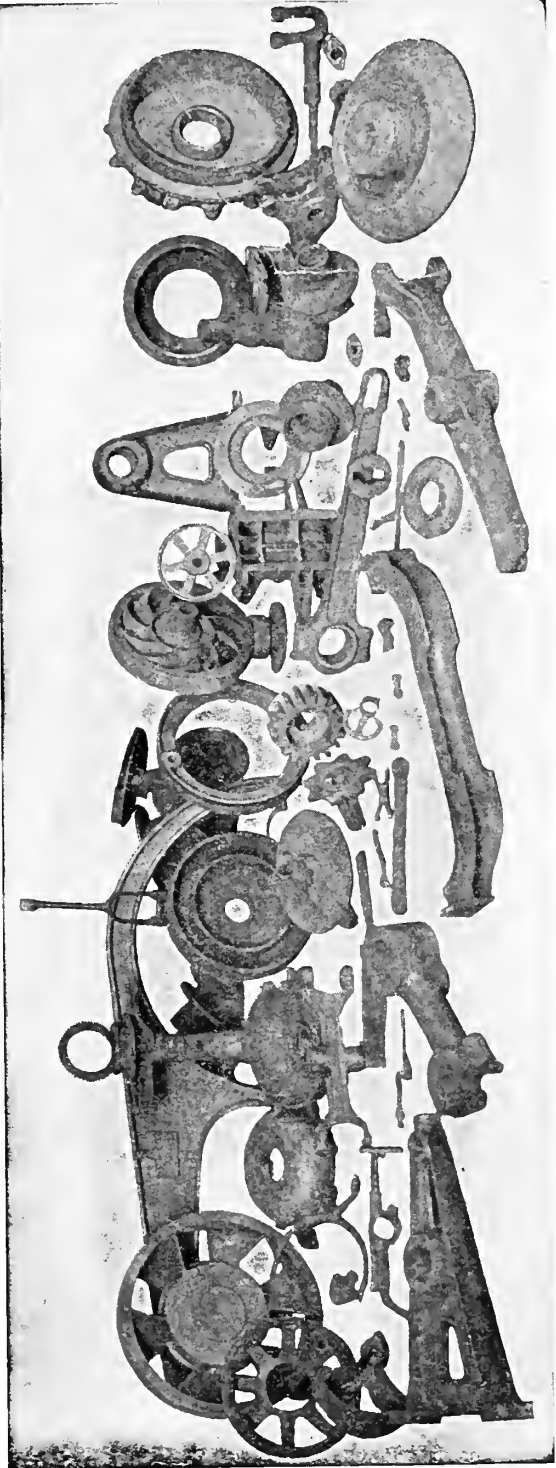
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## CASTINGS, Steel—Continued

Nortmann-Duffke Foundry Co., Layton, Ave., 26th to 27th, Milwaukee, Wis. (Crucible.)  
Oakley Steel Foundry Co., Millbury, Mass. (Crucible, nickel, nickel chrome & vanadium steel.)  
Oostburg Steel Foundry, Oostburg, Wis.  
Penn Mfg. Co., Chester, Pa.  
Racine Steel Castings Co., Racine, Wis. (Crucible.)  
Reading Steel Casting Co., Reading, Pa.  
Reed Mfg. Co., Kalamazoo, Mich. (Crucible.)  
Rippel, E. G. Steel Foundry Co., 31-39 Indiana St., Buffalo, N. Y.  
Schaefer Mfg. Co., Berlin, Wis. (Chilled.)  
Smith, Geo. Steel Casting Co., Milwaukee, Wis.  
Strong Steel Foundry Co., 2677 Main St., Buffalo, N. Y.  
Vulcan Iron Works, The, New Britain, Conn. (Semi steel, to order.)  
Whiteley Steel Co., Muncie, Ind. "Whiteley's Crown" (steel).  
Wilmington Malleable Iron Co., Wilmington, Del.

## CELLULOID, Sheet

Arlington Co., The, 725-27 Broadway, N. Y. City. "Pyralin." (Transparent sheets.)  
Celluloid Co., 30 Washington Pl., N. Y. City.  
Landers Brothers Co., Toledo, Ohio.  
Roehm & Davidson, Ltd., Detroit, Mich.

## CEMENTS, Leather

Van Cleef Bros., 7711 Woodlawn Ave., Chicago, Ill. "Pioneer."

## CEMENTS, Metal

Brand, S. H. Co., Chicago, Ill. "Egyptian." (Cast iron cement.)  
Callahan, Geo. & Co., 218 Front St., N. Y. City. "Callahan's Old Reliable." (Steam joint & pipe.)  
Central Foundry Supply Co., West Spring St., & H. V. Ave., Columbus, Ohio. "Best." (Steel cement for filling holes in defective casings.)  
Clark Cast Steel Cement Co., The, Shelton, Conn. "Steamtite" & "Cast Steel."  
Hazen-Brown Co., 100 South St., Boston, Mass. "Plug-Leak." (For stopping leaks in radiators, pipe joints, etc.)  
★Johns-Manville, H. W. Co., 100 Williams St., N. Y. City. ("J-M," asbestos cylinder, "Leak-No" metallic compound.)  
Longhurst, Jas. S., Jr., Lynbrook, L. I., N. Y. "Agatite." (For repairing leaks in engines, pipes & radiators.)  
Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. (Also "Stop Leak" for repairing leaks in radiators.)  
Pennsylvania Black Filler & Paint Co., Williamsport, Pa. "Keystone Iron Cement." (Iron pipe.)  
Shelton Metallic Filler Co., Derby, Conn. "Shelton." (Metallic filler.)  
Smooth-On Mfg. Co., 572-574 Communipaw Ave., Jersey City, N. J. "Smooth-On."

## CEMENT, Tire

Ball-Fintze Co., The, Newark, O. "Evalon."  
Brooklyn Rubber Co., 397-401 Summer Ave., Brooklyn, N. Y. "Clingfaster."  
★Diamond Rubber Co., Akron, O. "Titan" & "In-a-Jif."  
Empire Mfg. Co., 200 E. Exchange St., Akron, Ohio.  
★Firestone Tire & Rubber Co., Akron, O. "Firestone."  
★Fisk Rubber Co., Chicopee Falls, Mass. (Auto & Bi.)  
Fry, Keyser, 723-25 Chestnut St., Reading, Pa. "Ever Right."  
★G & J Tire Co., Indianapolis, Ind. "G & J."  
★Goodrich Co., B. F., Akron, O. "Goodrich."  
★Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear."  
Hartford Rubber Works Co., 691 Park St., Hartford, Conn.  
Hazen-Brown Co., 100 South St., Boston, Mass. "Pluto Cement," "Vulco-Nu-Tread" & "Hazenoid."  
India Rubber Tire Co., 1461 Michigan Ave., Chicago, Ill.  
★M. & M. Mfg. Co., Akron, O. "M. & M." & "Knead It."  
Mansfield Rubber Co., Mansfield, O. "Mansfield."  
Mattson Rubber Co., Lodi, N. J.  
Michelin Tire Co., Milltown, N. J. "Michelin."  
★Morgan & Wright, Foot of Bellevue St., Detroit, Mich.  
O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil."  
Parks Co., F. B., 173-5 Prescott St., Grand Rapids, Mich.  
★Peerless Cement Co., The, 39 Viaduct, Akron, O. "Peerless."  
Seamless Rubber Co., New Haven, Conn.  
Selbach Rubber Co., 471 Tremont St., Boston, Mass. "Selbach."  
Smith, C. J. & Co., St. Paul, Minn. "Cisco."  
Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."  
★Thermoid Rubber Co., Trenton, N. J.  
Tingley, Chas. O. & Co., Rahway, N. J. "C. O. T."  
Van Cleef Bros., 7711 Woodlawn Ave., Chicago, Ill. "Dutch."  
Williams Mfg. Co., Camden, N. J. ("Williams S-V," auto, & "Williams Plug-It" bicycle.)  
Young, Orlando W., 174-80 Frelinghuysen Ave., Newark, N. J.

## CEMENT, Wood Rim

★Diamond Rubber Co., Akron, O. "Diamond."  
★Goodrich, B. F. Co., Akron, O. "Goodrich."

## CHAINS, Cycle & Motorcycle

★Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass. "Baldwin." (Detachable, cycle.)  
★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. "Diamond."  
Duckworth Chain & Mfg. Co., 41 Mill St., Springfield, Mass. "Duckworth." (Cycle.)  
Hall, Chas. E. Co., 106 Broadway, Buffalo, N. Y. (Cycle.)  
Miller, Chas. E., 97-101 Reade St., N. Y. City. "Brampton." (Motorcycle, imported.)  
★Morse Chain Co., Ithaca, N. Y. "Morse" (Rocker.)  
★Whitney Mfg. Co., The, Hartford, Conn. "Whitney."  
Widmayer, F. B. Co., 2312 Broadway, N. Y. City. (Motorcycle.)

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**Chester, Pa.**

## CHAINS, Driving; Automobile

- ★Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass. "Baldwin." (Detachable.)
- ★Boston Gear Works, Norfolk Downs, Mass. Buhl Malleable Co., Wight & Adair Sts., Detroit, Mich.
- ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. "Diamond."
- ★Duryea, Chas. E., Reading, Pa. "Duryea." Grant Gear Works, Boston, Mass.
- Hoffnung, S. & Co., Ltd., 116 Broad St., N. Y. City. "Coventry Wormroller." (Imported.)
- Link Belt Co., Hunting Park Ave. & Reading Ry., Nicetown, Pa. "Maximum" & "Renold." (Silent & Roller.)
- Miller, Chas. E., 97-101 Reade St., N. Y. City. "Brampton." (Imported.)
- ★Morse Chain Co., Ithaca, N. Y. (Silent running, high speed and rocker.)
- National Sales Corporation, 232 W. 58th St., N. Y. City. "Peugeot." (Imported.)
- Raymond & Co., 331 Michigan Ave., Chicago, Ill. "Triumph."
- Rivetless Chain & Engineering Co., Lebanon, Pa.
- ★Whitney Mfg. Co., The, Hartford, Conn. "Whitney."

## CHAINS, Tire

(See Anti-skids.)

## CHAIN ADJUSTERS, Cycle

- Clark, A. N. & Son, Plainville, Conn.
- ★Corbin Screw Corporation, New Britain, Conn.
- Goddard, R. W. Co., 15 Abbott St., Worcester, Mass.

## CHAIN BELTS

- Caldwell, W. H. & Son Co., Western Ave., 17th to 18th St., Chicago, Ill.
- ★Whitney Mfg. Co., The, Hartford, Conn.

## CHAIN CLEANERS

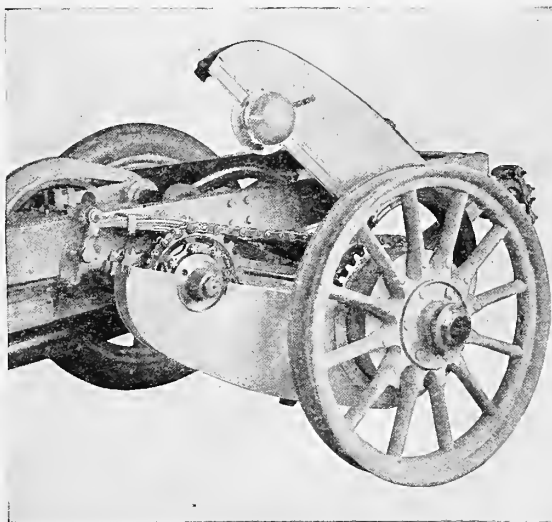
- American Wire Brush Co., 277 Greenwich St., N. Y. City. (Brushes.)
- Noonan Tool & Machine Works, 103½ and 105 Dominick St., Rome, N. Y. (Cycle.)

## CHAIN GUARDS, Automobile

- Bohnet, John & Co., 114-16 Grand Ave., South, Lansing, Mich. "Eclipse."
- Hawes Storm Front Co., 25 N. Hanchett St., Coldwater, Mich. "Hawes."

# DOUBLE CHAIN DRIVE

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ON 1910 CHADWICK CARS, Diamond Chains are housed in oil-tight, dust-proof aluminum cases, showing a vital improvement in chain driving.

The radius rods are situated in the center of the chain cases, their centers being the centers of the jack shaft and rear axle, which has an I beam section, simple, light and strong.

The above construction gives a free, flexible movement of springs and frame, greatly increasing the life of tires and riding comfort, in direct contrast to the rigid, wearing pulsating effect, unavoidable with the heavy shaft-driven rear axle, directly supported by the tires.

Under these ideal conditions, Diamond Chains are noiseless, and will outwear gears.

If you have a transmission problem, send for our literature, and get the free advice of our engineering department.

## DIAMOND CHAIN AND MFG. CO.

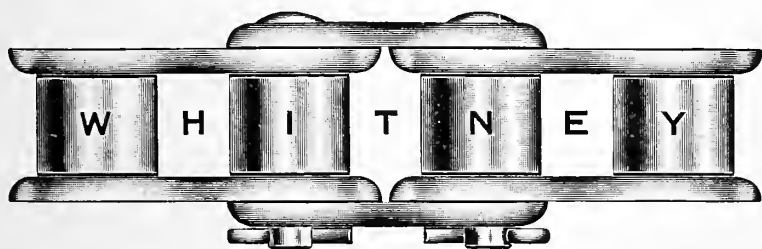
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260 West Georgia St., Indianapolis, Ind.



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**THE WHITNEY MFG. CO.**  
**HARTFORD, CONNECTICUT**



### CHAIN GUARDS, Automobile—Continued

Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.  
Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill. "Sorensen."  
(Chain guard & silencer.)

### CHAIN GUARDS, Cycle & Motorcycle

Clark, A. N. & Son, Plainville, Conn.  
Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y. "Forsyth" (metal, cycle.)

### CHAIN IDLERS, Motorcycle

Baker, F. A. & Co., 37 Warren St., N. Y. City.  
Capitol Specialty Works, 147 Hudson Ave., Albany, N. Y.  
Motor Cycle Specialty Co., 258 Columbus Ave., Boston, Mass. (Combination Chain Idler and Guide.)  
Mount, A. C., 1158 Washington St., Elizabeth, N. J.

### CHAIN LINKS

★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. "Diamond."

### CHAMOIS & SPONGES

Carbondale Calcium Co., Carbondale, Pa. "Carbondale."  
Greek American Sponge Co., Franklin & Randolph Sts., Chicago, Ill. (Imported.)  
Keystone Oil & Supply Co., Inc., Pittsburgh, Pa.  
Rhodes, J. H. & Co., Chicago, Ill.  
Smith, Kline & French Co., 429 Arch St., Phila., Pa.  
Western Robe Co., 43 Peck St., Chicago, Ill.

### CHANNEL STEEL

(See Raw Material.)

### CHASSIS, Complete

Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.  
★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo. (Gasoline.)  
★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. (Gasoline; to order.)  
Brewster & Co., Broadway & 47th St., N. Y. City. "Delaunay-Belleville." (Chassis, imported.)  
Continental Engine Co., Chicago, Ill. (Light delivery.)  
★Couple Gear Freight Wheel Co., The, 560 Buchanan St., Grand Rapids, Mich. (Electric, commercial.)

Dart Mfg. Co., 1422-28 Chase St., Anderson, Ind. "Dart." (Buggy.)  
Garford Co., The, Elyria, O. (Gasoline.)  
Jamesville Mfg. Co., Jamesville, N. Y. "Red-skin." (Gasoline.)

★McCue Co., Hartford, Conn. (Gasoline.)  
★McIntyre, W. H. Co., Auburn, Ind.  
Panhard & Levassor, Broadway & 62nd St., N. Y. City. (Imported.)  
Torhensen Motor Car Co., 610 Bloomfield Ave., Bloomfield, N. J. "Torhensen." (Gasoline.)  
★Waukesha Motor Co., The, Waukesha, Wis. (Complete power units.)

### CHECK VALVES

(See Valves.)

### CHECKS, Steering

(See Steering Checks.)

### CHIMES, Exhaust

(See Horns, Exhaust.)

### CHROME NICKEL STEEL

(See Raw Material.)

### CIGAR LIGHTERS

American Ever Ready Co., 304-22 Hudson St., N. Y. City. "Eveready."  
Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill. "Perretz."  
★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.  
Gerdelman, Benjamin Mfg. Co., 4630 Olive St., St. Louis, Mo. "Dark Light."  
Knoblock-Heideman Mfg. Co., The, South Bend, Ind. "Quick Action."  
Match-Less Light Co., The, Caxton Bldg., Cleveland, O. "Match-less."  
Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill. "Presto" (cigar lighters and lamps combined.)  
Motor Car Equipment Co., The, 55 Warren St., N. Y. City.  
O'Brien, Jos. F. Co., 63 Park Pl., N. Y. City.  
Wolff, Alfred & Co., 45 Vesey St., N. Y. City. (Imported.)

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**CIRCULATION PUMPS**

(See Pumps, Circulation.)

**CIRCULATION PUMP PARTS**

Electric Welding Products Co., The, Cleveland, Ohio. (Shafts.)  
 Parker White Metal & Machine Co., East 10th St. & Phila. & Erie R. R., Erie, Pa. "Parker."

**CLAMPS, Hose**

(See Hose Couplings.)

**CLEANSING COMPOUNDS, Auto Body**

Alder-Harper Chemical Co. Mount Vernon, N. Y. "Star-Clean."  
 Alexander, H. T. & Co., 17 State St., N. Y. City. (Soap.)  
 American Oil Co., 170-78 S. Water St., Jackson, Mich. "Amoco." (Soap.)  
 Automobile Oil Co., 723 Baronne St., New Orleans, La. "Famous." (Soap.)  
 Auto Oil Co., 172 S. Water St., Jackson, Mich. "Red Cross." (Soap.)  
 ★Baum's Castorine Co., Rome, N. Y. "Baum's" (soap.)  
 Bridgeport Wood & Finishing Co., The, New Milford, Conn. "Autoclean."  
 Brooks, Clarence & Co., 249-77 Chestnut St., Newark, N. J. "Brooks." (Renovator and cleanser.)  
 Cataract Refining & Mfg. Co., Buffalo, N. Y. (Soap.)  
 Cleanola Co., The 1101 Fulton Bldg., Pittsburgh, Pa. "Cleanola."  
 ★Columbia Lubricants Co. of New York, 116 Broad St., N. Y. City. "Monogram." (Soap.)  
 Crescent Oil & Grease Co., Cleveland, Ohio. "Franklin." (Soap.)  
 Crown Soap Co., 1941-43 W. Fayette St., Syracuse, N. Y. "Crown." (Oil soap.)  
 ★Davey & Co., 2600-08 Grand Ave., Chicago, Ill. "Puritan." (Soap.)  
 ★Davies, The J. P. Co., Dayton, O. "Buckeye Cleanser." (Soap.)  
 Detroit Varnish Co., Detroit, Mich. "Rogers Klenzer."  
 Eagle Lubricating Oil Co., 426-28 First Ave., Pittsburgh, Pa. "Eagle." (Linseed oil soap.)  
 Eclat Mfg. Co., 3425 State St., Chicago, Ill. "Eclat."  
 Energine Refining & Mfg. Co., 809 Cuyahoga Bldg., Cleveland, O. (Linseed oil soaps.)  
 Ericka Mfg. Co., The, 872-82 Liberty St., Springfield, Mass. "Ericka Auto-Car." (Soap.)  
 Fairchild, M. H. & Bro., 20 W. Michigan St., Chicago, Ill. (Soap.)  
 Fisk Mfg. Co., Springfield, Mass. (Soap.)  
 Flash Chemical Co., 9 & 10 Fulton St., Boston, Mass. (Flash.)  
 Franklin Oil Works, Franklin, Pa. (Soap.)  
 General Chemical Supply Co., The, 1565 Merwin Ave., Cleveland, Ohio. "Perfection." (Oil soap.)  
 General Oil Works, Traction Bldg., Indianapolis, Ind. "Reliable." (Soap.)  
 Great Western Oil Co., 2855 E. 37th St., Cleveland, O. "G.W." (Soap.)

Green Oil Soap Co., 22 Market St., Chicago, Ill. (Soap.)  
 Heaney Mfg. Co., 164 State St., Boston, Mass. "Heaney's." (Soap.)  
 Hofmeister, Leo Co., 396-98 Clinton St., Milwaukee, Wis. (Soap.)  
 ★Hollingshead, The R. M. Co., Camden, N. J. "Whizoil." (Soap.)  
 Hoosier Mfg. Co., Indianapolis, Ind. "Hoosier Knoxall." (Soap.)  
 Idealo Co., 228 N. 4th St., Phila., Pa. "Idealo." (Soap.)  
 ★International Metal Polish Co., 2142 N. Capitol Ave., Indianapolis, Ind. ("Blue Ribbon" soap & "Blue Ribbon Kleanolio," fab i cleanser.)  
 Kenney, F. Mfg. Co., 360-68 Dorchester Ave., Boston, Mass. "Olivine." (Compound.)  
 Keystone Oil & Supply Co., Inc., Pittsburgh, Pa. "Keystone." (Oil soap.)  
 Kirk, James S. & Co., N. Water St., Chicago, Ill. "American Crown." (Soap.)  
 Kleino Mfg. Co., Inc., N. Weymouth, Mass. (Soap bark compound.)  
 Linosoap Co., 942-44 W. 5th St., Cincinnati, O. "Linosoap."  
 Lucas, John & Co., 4th & Race Sts., Phila., Pa.  
 Lynch, Alonzo K., Inc., 310-12 Flushing Ave., Brooklyn, N. Y. "Advance." (Soap.)  
 Miller's, Wm. P. Sons, Nott Ave. & Hancock St., L. I. City, N. Y. "Pan-O-Lite." (Soap.)  
 Modoc Co., The, Fernwood, Pa. (Linseed soft soaps.)  
 Monahan Antiseptic Co., 100 Market St., Chicago, Ill. "Green Oil." (Soap.)  
 Morris, R. W. Co., 17 E. Missouri Ave., Kansas City, Mo. "Golden Star." (Polish.)  
 National Tripolio Co., 543 W. Goodale St., Columbus, Ohio. "National." (Linseed oil soap.)  
 New York Oil & Paint Co., 1282 Maiden Lane, N. Y. City. "Bully." (Soap.)  
 Oakes, Fred T., 150 Nashua St., N. Y. City. "Oakes."  
 Pennsylvania Oil Works Co., 1771 Broadway, N. Y. City. "Zenith."  
 Petroleum Products Co., 3600 Grand Blvd., Pittsburgh, Pa. (Soap.)  
 Pierce & Rice Oil Co., 554 Park Ave., Worcester, Mass. (Soaps.)  
 Pigot, Sayre Co., The, 135 William St., N. Y. City. "Aurora." (Soap.)  
 Rexine Co., The, 725 New York Ave., Sheboygan, Wis. "Rexine." (Soap.)  
 Robertson, J. T. Co., Manchester, Conn. "Robertson's" (soap.)  
 Sanitary Wool Cleansing Co., Room 203-5, 101 Beekman St., N. Y. City.  
 Shannon, T. R., Hartford, Conn. "Rapid."  
 Sonneborn, L. Sons, Fulton & Pearl Sts., N. Y. City. "Amalie."  
 Spere's Sons Co., The Alden, 369 Atlantic Ave., Boston, Mass. (Soap.)  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Varno Vim." (Soap.)  
 Stanley, John T., 650 W. 30th St., N. Y. City. "Mobo."  
 Strunz, S. & Son, 708 Bingham St., Pittsburgh, Pa. "Lin-O." (Soap.)  
 Sweet, Charles F., Inc., 20 Ford St., Hartford, Conn. "Sweet's." (Soap.)  
 Tropical Oil Co., W. 70th St., & L. S. & M. S. Ry., Cleveland, Ohio. (Soap.)  
 Western Robe Mills, 43 Peck St., Chicago, Ill. (Soap.)  
 ★White & Bagley Co., The, Worcester, Mass. "Washzum." (Car soap.)  
 White Refining Co., 77 Main St., Buffalo, N. Y. "Ultra." (Oil soap.)  
 White Star Refining Co., 307 White Bldg., Buffalo, N. Y. "Dutch Oil." (Soap.)  
 Winn, W. R., 143 Maiden Lane, N. Y. City. "Cleaneasy." (Soap.)  
 Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J. (Soap.)

★ indicates Advertisers—see Index in back of book.

**CLEANSING COMPOUNDS, Hand**

- American Talc Co., 22-24 Custom House St., Boston, Mass. "Talcum Instant" & "Borated Talcum." (Soap.)
- Automobile Repair Co., 1103-05 Pine St., St. Louis, Mo. "Newbern's." (Linseed oil soap.)
- Bates, Howard M., 1018-34 Fairmount Ave., Phila., Pa. "Bates' Grit Soap" & "Bates Rite Off." (Soap.)
- ★ Baum's Castorine Co., Rome, N. Y. "Baum's." Bobrick Chemical Co., The, 111-17 S. Garey St., Los Angeles, Cal. "Sop-O-Zon."
- Byram Mfg. Co., Box 3133, Boston, Mass. "Zlz." (Soap.)
- Cedaroleum Company, Perkinsville, Vt. "Cedaroleum." (Fluid and paste.)
- Cross, W. H. & Ladd Co., 29 Murray St., N. Y. City. "Unedit."
- ★ Davies Co., J. P., Dayton, O. "Whiz." Ericka Mfg. Co., The, Inc., 872-82 Liberty St., Springfield, Mass. "Ericka." (Soap.)
- Flash Chemical Co., 9 & 10 Fulton St., Boston, Mass. "Flash." (Antiseptic and cleaner.)
- Frost Stamp & Stationery Co., 505 Main St., Worcester, Mass. "Quick Klean" & "Clean-Paw."
- Green Oil Soap Co., 22 Market St., Chicago, Ill. "Kels-Castile." (Soap.)
- Heaney Mfg. Co., 164 State St., Boston, Mass. "Heaney." (Soap.)
- ★ Hollingshead, The R. M. Co., Camden, N. J. "Krystal Soiloff" & "Washazy."
- ★ Hopewell Bros., 29 Chapel St., Newton, Mass. "Paos." (Soap.)
- Imperial Polish Co., The, 208 W. Kinzie St., Chicago, Ill. ("Imperial" & "Jumbo" hand soap & "K. L. Brand" pumice stone.)
- Kenney F. Mfg. Co., 360-68 Dorchester Ave., Boston, Mass. "Lightning."
- Kielgass-Lehman Co., 208 W. Kenzie St., Chicago, Ill. ("Imperial" & "Jumbo" hand soap & "K. L. Brand" pumice stone.)
- Kleno Mfg. Co., Inc., N. Weymouth, Mass. "Kleno" (soap.)
- Klenzola Co., The, 1300 Peach St., Erie, Pa. "Klenzola."
- Levy, Dr. H. Howard, Inc., 44 West 34th St., N. Y. City. "4-All." (Soap.)
- Mattoon Mfg. Co., 120 Allyn St., Hartford, Conn. "Mattoon's." (Soaps & Powders.)
- Mione Mfg. Co., The, Hartford, Conn. "Mi-one." (Soap.)
- Monahan Antiseptic Co., 100 Market St., Chicago, Ill. ("Green Oil," also "Kels-Castile" soaps.)
- National Tripolio Co., The, 543 W. Goodase St., Columbus, Ohio. ("Tripoli" toilet soap & "Toilet Tripoli" soap powder.)
- Nesmith, C. I. Co., Reading, Mass. "Rex." (Soap.)
- New York Oil & Paint Co., 128 Maiden Lane, N. Y. City. "Handy." (Soap.)
- Rath Mfg. Co., Hancock & Hedley Sts., Phila., Pa. "Finga-Brite" (soap & pastes.)
- Rexine Co., The, 725 New York Ave., Sheboygan, Wis. "Rexine." (Toilet soap.)
- Robertson, J. T. Co., Manchester, Conn. "Van-co." (Soap.)
- Robinson, W. R., Foot Essex St., Jersey City, N. J. "Whitene."
- Skat Mfg. Co., Hartford, Conn. "Skat." (Soap.)
- Skidoo Soap Co., Michigan & Buttle Ave., Columbus, Ohio. "Skidoo."
- Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Curo San." (Soap.)
- Stanley, John T., 650 W. 30th St., New York City. "Shofa."
- Utility Co., 636-38 West 44th St., N. Y. City. "Gre-Solvent."

- ★ Victor Auto Supply Mfg. Co., 42 West 43d St., N. Y. City. "Vasco." (Soap.)
- Waltke, Wm. & Co., East Grand Ave. & 2nd St., St. Louis, Mo. "Lava." (Soap.)
- ★ White & Bagley Co., The, Worcester, Mass. "Cleansum." (Soap.)
- Winn, W. R., 143 Maiden Lane, N. Y. City. "Cleaneasy." (Soap.)
- Zurn, O. F. Co., Broad & Lehigh Ave., Phila., Pa. "Magic." (Soap.)

**CLOCKS**

- American Ever Ready Co., 304-22 Hudson St., N. Y. City. "Eveready." (Electrically illuminated dashboard.)
- ★ American Thermo-Ware Co., 16 Warren St., N. Y. City. (Imported.)
- Baldwin & Overholt, Galesburg, Ill. "B. & O. Line."
- ★ Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Cloverleaf" & "Aurora."
- Boston Nickel Plating Co., Inc., 160 Portland St., Boston, Mass. (Watches, auto & boat.)
- Chelsea Clock Co., 16 State St., Boston, Mass. "Chelsea." (Auto and marine.)
- ★ Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "The Cox."
- Donaldson & Fisher Co., 218-220 W. Kinzie St., Chicago, Ill. (Auto & motorcycle.)
- Eisner, Harry & Co., 29 Scotia St., Boston, Mass. "Volta."
- Industrial Instrument Co., Foxboro, Mass. "Standard." (Electric.)
- Ingersoll, Robert H. & Bro., 45 John St., N. Y. City. "Ingersoll." (Also watches.)
- Jones Speedometer, The, Broadway & 76th St., N. Y. City. "Jones."
- Levy, Manasseh & Co., 182 Broadway, N. Y. City. "Safety Offset."
- Motor Car Equipment Co., The, 55 Warren St., N. Y. City.
- ★ Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss."
- New England Watch Co., The, Waterbury, Conn. "New England." (Watches for limousine toilet racks.)
- Newman Clock Co., 1526 Wabash Ave., Chicago, Ill.
- New York Standard Watch Co., Jersey City, N. J. (Chronograph watch.)
- Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O. "Perfection." (Auto, motorboat & motorcycle.)
- Reliance Speedometer Co., 134 Elliot St., Boston, Mass. "Reliance."
- Waterbury Clock Co., Waterbury, Conn.

**CLOTHING, Motorists'**

(See also Caps, Gloves &amp; Leggings.)

- Abercrombie & Fitch Co., 57 Reade St., N. Y. City.
- Appel, S. & Co., 18 Fulton St., N. Y. City. (Yachting.)
- Auto Garment Co., 208 B Ave., Cedar Rapids, Ia. "To Go."
- Automobile Apparel Co., 14 W. 22nd St., N. Y. City. (Fur & fur lined coats, water proof coats, dusters, leather clothing, etc.)
- Beckman Co., The, 3167 Fulton Road, Cleveland, Ohio. (Wool Shawls.)
- Bishop, The J. H. C., Wyandotte, Mich. (Fur coats.)

★ indicates Advertisers—see Index in back of book.

**CLOTHING, Motorists'—Continued**

Boehm & Levine, 561-63 Broadway, N. Y. City. ("Mon Bijou" combination scarf and hood with veil; "Minnie Dupree" auto veils.)

Bradley Knitting Co., The, 19 Ninth St., Delavan, Wis. "Bradley." (Auto scarf.)

Carpenter, Geo. B. & Co., 202-8 South Water St., Chicago, Ill. (Oilskin Yachting.)

Cary, James S. Co., 48-50 Commercial Ave., Binghamton, N. Y. (Dusters.)

Chicago Auto Robe Supply Co., 157 Market St., Chicago, Ill. (Fur lined and fur coats & foot warmers.)

Clifton Mfg. Co., Boston, Mass.

Cook, E. C. & Bro., 49 E. Kinzie St., Chicago, Ill.

Davis Robe Co., The, Inc., 126 S. State St., Chicago, Ill. "Davis." (Arctic over pants.)

Demmerle & Co., 248 W. 23rd St., New York, N. Y.

Draper Bros. Co., Canton, Mass. (Coat sweaters.)

Ellsworth & Thayer Mfg. Co., Milwaukee, Wis. (Fur auto coats.)

Fuller & Sullivan, 11-19 Eliot St., Boston, Mass. "F. & S."

Gilbert Mfg. Co., New Haven, Conn. (Capes.)

Goldwasser, L. & Co., 14 W. 22nd St., N. Y. City. (Fur lined coats.)

Gunther, G. C. Sons', 184 Fifth Ave., N. Y. City. (Fur and fur lined coats, etc.)

Hodgman Rubber Co., 306 Broadway, N. Y. City. "Hodgman."

★Hopewell Bros., 29 Chapel St., Newton, Mass. "Hopewell." (Vests.)

Kenyon, C. Co., 23 Union Sq., N. Y. City. "Kenyon."

Kling Bros. & Co., 291 Fifth Ave., Chicago, Ill.

MacDonald & Campbell, 1334-36 Chestnut St., Phila., Pa.

Mann, Leon, Co., 715-19 Broadway, N. Y. City. (Coats & chauffeurs' suits.)

Milford Shoe Co., The, Milford, Mass. "Milford." (Leather.)

Miller, Louis F. & Son, 722 Broadway, N. Y. City.

Mischel Bros., 15 E. 12th St., N. Y. City. "Champion" (Water-proof coats.)

Moore-Smith Co., Winthrop Square, Boston, Mass. (Fur.)

Morawitz Co., The, 217-225 East Water St., Milwaukee, Wis. (Furs and fur coats.)

Mount Vernon Furriers, The, 242 South 10th Ave., Mount Vernon, N. Y. (Leather & fur coats & neckwear.)

★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan." (Sleeve protectors and rubber capes.)

National Casket Co., 50 Great Jones St., N. Y. City.

National India Rubber Co., Bristol, R. I. (Rubber shirts.)

Our Own Mfg. Co., 568-74 Broadway, N. Y. City.

Parker, John H. Co., 25 James St., Malden, Mass. ("Parker's Arctic" jackets & "Parker's" vests and socks.)

Raino Co., The, 1828-30 S. Halsted St., Chicago, Ill. "Raino." (Waterproof auto and nautical.)

Raymond, A. & Co., Nassau & Fulton Sts., N. Y. City. "Raymond."

Revillon Freres, 19 W. 34th St., N. Y. City. (Coats.)

Rex Shield & Mfg. Co., Connerville, Ind. "Rex." (Capes, sleevelets & repair aprons.)

Rogers, Peet & Co., 842 Broadway, N. Y. City.

Rosenthal & Katz, 11 W. 17th St., N. Y. City.

Rosenwald & Weil, Inc., Franklin, Congress & Market Sts., Chicago, Ill. "R. & W." (Chauffeur suits & auto dusters.)

Rusbits, John Fur Co., 69-73 E. 11th St., N. Y. City.

Sanborn Mfg. Co., 151-55 W. 25th St., N. Y. City. "We Stop Rain." (Rain coats.)

Scandinavian Fur & Leather Co., 16 W. 33rd St., New York, N. Y.

Scott Knitting Co., The, 175 Main St., Portsmouth, O. "Scott." (Neck, ear, face and chest mufflers & knit coats.)

Shuman, A. & Co., Washington & Summer Sts., Boston, Mass.

Spear-Martin Fur Co., 41 Church St., Burlington, Vt. "Spear's Adirondack." (Furs, fur & fur lined coats & mufflers.)

Sprague, F. H. Co., Orange, Mass.

Toplitz, George, 878 Broadway, N. Y. City.

Tower, A. J. Co., Vernon & Simmon Sts., Boston, Mass. "Tower's Fish Brand." (Waterproof oiled automobile and yachting.)

Trans-Atlantic Mercantile Co., 172 Fifth Ave., N. Y. City. "Protex." (Raincoats.)

Uptegrove Sporting Goods Co., Valparaiso, Ind. (Also motor boat.)

★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon." (Sleeve protectors.)

★Wallace, Hugh Co., 1680 Orleans St., Detroit, Mich. (Fur & fur lined coats.)

Waterproof Garment Co., 3 E. 14th St., N. Y. City. (Waterproof rain coats, storm capes & sleeve protectors.)

Way Muffler Co., The, 23rd & Arch Sts., Philadelphia, Pa. "Way." (Mufflers & sweater coats.)

Webber, George F., Station F., Detroit, Mich. "Webber's." (Hand knit jackets.)

Western Robe Mills, 43 Peck St., Chicago, Ill. (Fur auto coats.)

Wild, Joseph & Co., 366-370 Fifth Ave., N. Y. City. (Coats.)

**CLUTCHES, Automobile**

Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.

American & British Mfg. Co., Bridgeport, Conn. "A & B."

Auto Parts Mfg. Co., South Elliot St. & T. E. W. R., Muncie, Ind. "B. T. K."

Auto Trading & Repair Co., 1515 Prospect Ave., Cleveland, O. "Auto T. & R. Co." (Special for White steam cars.)

★Brownell, F. A. Motor Co., 634-6 Lexington Ave., Rochester, N. Y.

Burt Mfg. Co., Clinton & Fulford Sts., Kalamazoo, Mich. "Kalamazoo." (Friction.)

Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."

★Continental Motor Mfg. Co., Muskegon, Mich.

Dolson Auto Supply Co., Muncie, Ind. (Cone.)

Elkhart Motor Car Co., Elkhart, Ind. "Sterling." (Expansion.)

★General Mfg. Co., The, Elkhart, Ind. (Cone.)

Hazard Engineering Co., Maple & Scherer Sts. & N. Y. C. R. R., Rochester, N. Y.

Hilliard Clutch & Machinery Co., 104 W. 4th St., Elmira, N. Y.

Industrial Automobile Co., The, Elkhart, Ind.

Jencick Motor Mfg. Co., Port Chester, N. Y.

Johnson Service Co., Cor. Michigan & Jefferson Sts., Milwaukee, Wis.

Jonz Automobile Co., Beatrice, Neb. "Jonz."

★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.

★Long Arm System Co., E. 38th St. & Lakeside Ave., Cleveland, O.

★McCue Co., Hartford, Conn.

★Merchant & Evans Co., 517 Arch St., Phila., Pa. "Hele-Shaw."

★Model Gas Engine Works, Peru, Ind.

Munsing Mfg. Co., Hoboken, N. J. "Munsing."

National Brake & Clutch Co., 16 State St., Boston, Mass. (Cork inserts; Patentees & Licensors.)

**CLUTCHES, Automobile—Continued**

- North Chicago Machine Co., The, North Chicago, Ill. "Palmbla." (Hydraulic oil.)  
 Northway Motor & Mfg. Co., Maybury Ave., Detroit, Mich.  
 Peerless V Belt Co., The, 334-38 S. Clinton St., Chicago, Ill. "Peerless."  
 Philadelphia Gear Works, 1120-22 Vine St., Phila., Pa.  
 Piggins Bros., Racine, Wis. "Piggins."  
 Portland Garage, Portland, Me. (Balance wheel and cut-out for 1903-4 White cars.)  
 Reed Mfg. Co., Kalamazoo, Mich. (Cone.)  
 Russom Mfg. Co., North Aurora, Ill.  
 ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.  
 Spade Bros., Vicksburg, Mich.  
 Sturtevant Mill Co., The, Harrison Square, Boston, Mass. (Centrifugal.)  
 ★Tippett Mfg. Co., The, 172-82 W. Locust St., Columbus, O.  
 Wabash Gear Works, Terre Haute, Ind.  
 Warner Clutch Co., Railway Exchange Bldg., Chicago, Ill. "Constrictor."  
 ★Warner, T. W. Co., Muncie, Ind.  
 ★Warner Gear Co., Muncie, Ind. "Warner."  
 ★Warner Mfg. Co., Toledo, O.  
 ★Waukesha Motor Co., The, Waukesha, Wis.  
 ★Williams Foundry & Machine Co., Akron, O. "Akron."

**CLUTCHES, Boat**

- Durkee, C. D. & Co., Inc., 2 South St., N. Y. City.  
 Evans Stamping & Plating Co., Cushman St., Taunton, Mass. "Paragon." (One way.)  
 Johnson, The Carlyle Machine Co., P. O. Box D, Manchester, Conn. (Cut-off coupling.)  
 Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich.  
 Mietz, Aug., 128-138 Mott St., New York, N. Y. "Mietz."  
 Snow & Petrelli Mfg. Co., 441-445 Chapel St., New Haven, Conn. (One way.)  
 Warner Clutch Co., Railway Exchange Bldg., Chicago, Ill. "Constrictor."  
 Williams Foundry & Machine Co., Akron, O. "Akron."

**CLUTCHES, Marine Reverse**

(See Reverse Gears.)

**CLUTCH DISCS**

- Atkins, E. C. & Co., Indianapolis, Ind.  
 Barry Saw Co., 228 S. Penn St., Indianapolis, Ind. (Steel.)  
 Columbia Steel Co., Elyria, Ohio.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Emerson, Smith & Co., Ltd., Beaver Falls, Pa.  
 Jewell Belting Co., 53 Trumbull St., Hartford, Conn.  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, Ohio.  
 Stoll Pressed Steel Co., Buffalo, N. Y. (Steel.)  
 U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.

**CLUTCH COMPOUND OR DRESSING**

(See Belt &amp; Clutch Dressing.)

**CLUTCH LINING**

- ★American Belting & Tanning Co., 135 Oliver St., Boston, Mass.  
 Rahmann, Geo. & Co., 6 Ferry St., N. Y. City. "Hydraulic." (Leather.)  
 Republic Belting Co., The, Cleveland, O.  
 ★Royal Equipment Co., The, 414-32 Housatonic Ave., Bridgeport, Conn.

**COASTER BRAKES, Cycle & Motorcycle**

- ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor."  
 Buffalo Metal Goods Co., 865 Lafayette Ave., Buffalo, N. Y. "Atherton."  
 ★Corbin Screw Corporation, New Britain, Conn. "Corbin Duplex."  
 ★Eclipse Machine Co., Elmira, N. Y. "Eclipse."  
 Forsyth Mfg. Co., 308-14 Terrace St., Buffalo, N. Y. "Forsyth." (Cycle.)  
 Hurck Motor & Cycle Co., 109 N. 12th St., St. Louis, Mo. "Hurck."  
 Miama Cycle & Mfg. Co., Grand Ave., Middletown, O. "Musselman."  
 ★New Departure Mfg. Co., Bristol, Conn. "New Departure."

**COATS**

(See Clothing.)

**COAT RAIL BAGS**

- ★Ajax Trunk & Sample Case Co., 91-93 Mercer St., N. Y. City.  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."  
 ★Winship, W. W., 71 Summer St., Boston, Mass.

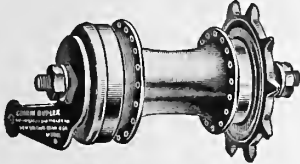
**COCKS**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill. (Pet.)  
 American Injector Co., Detroit, Mich. (Air.)  
 Ashton Valve Co., 271 Franklin St., Boston, Mass. "Ashton." (Gage & compression relief.)  
 Belfield, H. & Co., 435 N. Broad St., Phila., Pa. (Brass & iron.)

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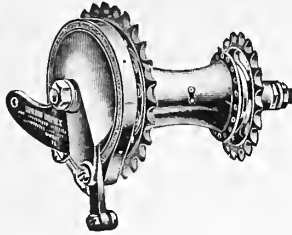
WOOD, MACHINE, CAP AND SET SCREWS; STOVE, TIRE, SINK  
AND AGRICULTURAL BOLTS

**Corbin Duplex**



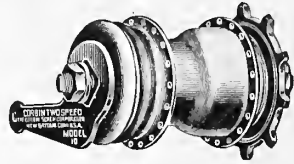
**Coaster Brake Model 8**

**Corbin Band Motorcycle**



**Coaster Brake Model 11**

**Corbin Two-speed**



**Coaster Brake Model 10**

Steel and Brass Jack and Safety Chain; Steel and Brass Escutcheon Pins  
Special Screws of Every Description

*Complete Catalogue on Request*

Licensed Coaster Brake Manufacturers

**THE CORBIN SCREW CORPORATION**

NEW BRITAIN, CONN.

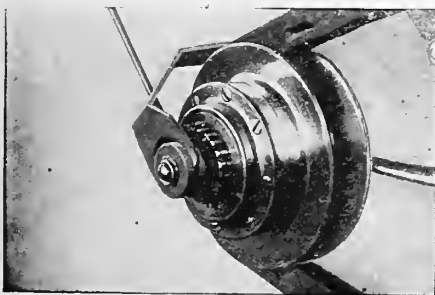
NEW YORK

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*Control at Your Finger's Tip*  
**The Eclipse Free Engine Pulley**

can be attached to any belt-driven motorcycle. Saves gasoline and muscle, as the power can be shut off on the down-grade and the motorcycle can be started without working against the compression of the engine. It works on the principle of an automobile clutch and for steep hill work can be readily slipped to increase climbing power.



**Price, \$15.00**

For sale nearly everywhere. If your dealer does not sell it, write to us and we will tell you where it can be purchased.

We "made good" with our **Eclipse Coaster Brake**, and we stake our reputation on the **Eclipse Free Engine Pulley**.

We are also manufacturing Aeroplane hubs. If interested, write for particulars.

**Eclipse Machine  
Company**

**ELMIRA :: :: N. Y.**

**COCKS—Continued**

- Buckeye Iron & Brass Works, 324 E. 3rd St., Dayton, O. (Air.)  
 Crane Co., 1214 S. Canal St., Chicago, Ill. (Air.)  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich.  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Globe Brass Works, 15-17 Macomb St., Detroit, Mich. (Air.)  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. (Air.)  
 Haydenville Co., Haydenville, Mass. "Haydenville." (Pet. air, oil & drip.)  
 Homer Brass Works, 231 Race St., Phila., Pa. (Pet.)  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Pet.)  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 Industrial Instrument Co., Foxboro, Mass. "Standard." (Compression, priming and air.)  
 Kelly & Jones Co., Greensburg, Pa. (Pet.)  
 Locke Regulator Co., Salem, Mass.  
 ★Lunkenheimer Co., The, Cincinnati, Ohio. (Spring key & compression relief.)  
 McRae & Roberts Co., 227-35 Campbell Ave., Detroit, Mich. (Pet, priming, relief, etc.)  
 Michigan Lubricator Co., 661-671 Beaubien St., Detroit, Mich. (Air & primer.)  
 ★National Tube Co., Frick Building, Pittsburgh, Pa. (Brass & iron.)  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Perfection Supply Co., Detroit, Mich. "Perfection." (Combination priming and relief.)  
 Powell, Wm. Co., 2521-2531 Spring Grove Ave., Cincinnati, O. (Cylinder relief.)  
 Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich. (Pet, drain and gasoline feed.)  
 United Brass Mfg. Co., Cleveland, O. "United."  
 Westinghouse Air Brake Co., Pittsburgh, Pa. (For air compressors.)

**COCKS, Priming**

(See Priming Devices.)

**COIL BOXES**

(See Battery &amp; Coil Boxes.)

**COILS, Induction**

(See Spark Coils.)

**COLLAPSIBLE BUCKETS AND BASINS**

- Abercrombie & Fitch Co., 57 Reade St., New York, N. Y.  
 ★Goodrich, B. F. Co., Akron, O.  
 Hodgman Rubber Co., 806 Broadway, N. Y. City.  
 National India Rubber Co., Bristol, R. I. (Buckets.)  
 Noera Mfg. Co., Waterbury, Conn. "Noera." (Collapsible drinking cups.)  
 Planet Co., The, Westfield, Mass. "Duplex."

★ indicates Advertisers—see Index in back of book.

**COLORS, Coach**

(See Paints &amp; Colors.)

**COMMUTATORS**

(See Timers.)

**COMPASSES, Auto**

U. S. Auto Compass Co., 411 Grand Ave., Milwaukee, Wis. "Kraemer."

**COMPASSES, Boat**

Pneumatic Mfg. Co., The, 243 South St., N. Y. City.

**COMPENSATING GEARS**

(See Differential Gears.)

**COMPOSITION CASTINGS**

(See Castings, Composition.)

**COMPRESSION RELIEF COCKS**

(See Cocks.)

**CONDENSERS, Spark Coil**

American Electric Co., State &amp; 64th Sts., Chicago, Ill. "Self-Sealing."

**CONDENSERS, Steam**

Rome-Turney Radiator Co., Rome, N. Y. (Flat finned.)  
 Steam Carriage Boiler Co., W. First & Albany Sts., Oswego, N. Y.

**CONES, Ball**

(See Cups &amp; Cones.)



## CONNECTING RODS

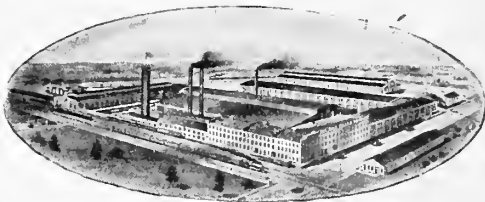
- Anderson Forge & Mach. Co., 21-31 St. Aubin Ave., Detroit, Mich.  
 Atlas Drop Forge Co., Lansing, Mich.  
 Barnett Drop Forging Co., East Hampton, Mass.  
 Bates Forge Co., Indianapolis, Ind.  
 Chicago Drop Forge & Foundry Co., Kensington Sta., Chicago, Ill.  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel, to order.)  
 Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.  
 ★Cramp, The Wm. & Sons S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 Detroit Forging Co., Detroit, Mich.  
 Electric Welding Products Co., The, Cleveland, O.  
 Erie Forge Co., Erie, Pa.  
 Ferro Machine & Foundry Co., 115 Wade Bldg., Cleveland, O.  
 ★Gill, P. H. & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y.  
 ★Mechanical & Electrical Mfg. Co., rear 2227 Prairie Ave., Chicago, Ill.  
 New Process Steel Co., The, 210 W. River St., Marshall, Mich. (Crucible steel.)  
 Obenberger Drop Forge Co., 220-224 Lake St., Milwaukee, Wis.  
 Richmond Forgings Corporation, Richmond, Va.  
 ★Standard Connecting Rod Co., The, Beaver Falls, Pa.  
 Transue & Williams Co., The, Alliance, O.

## CONTRACT WORK

- (See also Machine Work.)  
 Adams Bros. Co., The, Findlay, O.  
 Aetna Brass & Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O.  
 Alexander & Cox, Ogden & Western Aves., Chicago, Ill.  
 Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. (Blacksmithing.)  
 Ashley Machine Works, 714 University Ave., Rochester, N. Y.  
 Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich. (Brass work.)  
 Belfield, H. & Co., 435 N. Broad St., Phila., Pa. (Brass work.)  
 Cassady-Fairbank Mfg. Co., The, 6106-6130 La Salle St., Chicago, Ill.  
 Delphi Machine Works, Delphi, Ind.  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, O.  
 Greenhalgh Engine & Machine Works, 550-552 Central Ave., Newark, N. J.  
 Haydenville Co., The, Haydenville, Mass. (Brass.)  
 Hibbard Engineering Co., 872 Woodward Ave., Detroit, Mich.  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.  
 Malleable Iron Fittings Co., Branford, Conn.  
 Massnick-Phipps Mfg. Co., 1091 Champlain St., Detroit, Mich.  
 Medina Machine & Stamping Co., Medina, N. Y.  
 ★Michigan Automobile Co., Ltd., Kalamazoo, Mich.  
 Michigan Auto Parts Co., 1559-1561 Jefferson Ave., W., Detroit, Mich.  
 Morrow Mfg. Co., Elmira, N. Y.  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill. (Cutting by Oxy-acetylene.)

# Auto Parts

**Do you realize what it would mean to you to have our equipment, skill and almost unlimited capacity at your command?**



OUR PLANT HAS FIVE ACRES OF FLOOR SPACE

**¶ We can relieve you of all worry about details of design, manufacture and delivery of high-grade Bronze Parts for Automobiles.**

**¶ Our services include expert engineering supervision, skilled workmen, modern factory methods and equipment, careful inspection and almost unlimited capacity.**

**¶ Do not confuse our service with that afforded by ordinary shops; it means much more to you.**

**¶ We want only high-grade work for particular people.**

**¶ We are now making Steering Gears, Circulating Pumps and Fittings, Bearings, Bushings, Hub Caps, etc., for some of the most exacting Automobile Manufacturers in the country, to their entire satisfaction, from their own designs.**

**¶ Do not forget, we make prompt shipments.**

**PRICE AND DELIVERY NAMED ON RECEIPT OF YOUR DRAWINGS OR SPECIFICATIONS**

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 MANSFIELD, OHIO, U. S. A.

**CONTRACT WORK—Continued**

- Quincy Brass Works, Inc., The, 130-34 S. Clinton St., Chicago, Ill.  
 ★ Rutter, Arthur T. & Co., 256 Broadway, N. Y. City.  
 Schatz Mfg. Co., The, Poughkeepsie, N. Y.  
 † Sier-Bath Co., 143 W. 54th St., N. Y. City.  
 † Sterling Machine & Stamping Co., Wellington, Ohio.  
 Stevens Mfg. Co., Marinette, Wis.  
 Taft-Peirce Manufacturing Co., The, Woonsocket, R. I.  
 Wade Machine Co., 287 Atlantic Ave., Boston, Mass.  
 Warner Bros., Cor. High & Howard Sts., Muncie, Ind.  
 Western Tool & Forge Co., Brackenridge, Pa.

**CONTROLLERS, Electric**

- Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.  
 ★ General Electric Co., Schenectady, N. Y. "G.E."  
 Lincoln Electric Co., 38th & Kelley Ave., N. E., Cleveland, O.  
 ★ Westinghouse Electric Mfg. Co., Pittsburg, Pa.

**COOLERS, Water**

(See Radiators.)

**CORES, Spark Plug**

(See Insulation.)

**CORK FLOATS**

(See Carburetor Floats.)

**CORK INSERTS**

- National Brake & Clutch Co., 16 State St., Boston, Mass. "Compo."  
 ★ Paddock Cork Co., 1209-17 De Kalb Ave., Brooklyn, N. Y. (For friction devices.)

**COTTER PINS**

- Brooks, M. S. & Sons, Chester, Conn.  
 Cobb & Drew, Inc., Plymouth, Mass.  
 Hindley Mfg. Co., Valley Falls, R. I. "Columbia."  
 Jenckes, E. Mfg. Co., Worcester, Mass. (Spring.)  
 La Buire Import Co., 123 W. 68th St., New York, N. Y.

- Patterson, Gottfried & Hunter, 146-150 Centre St., N. Y. City. (In boxes.)  
 St. Louis Screw Co., St. Louis, Mo.  
 Smith, F. P. & Co., Sharon Hill, Pa. "Saco."  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. (Spring.)

**COTTON WASTE**

(See Waste, Wiping Rags, etc.)

**COUNTERSHAFTS, Auto**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 Continental Engine Co., Chicago, Ill. (Jack shafts.)  
 Muncie Gear Works, Muncie, Ind. "Muncie."  
 Syracuse Gear Co., 105 Grape St., Syracuse, N. Y. (Jack shafts, to order.)

**COUPLINGS, Hose**

(See Hose Couplings.)

**COUPLINGS, Pipe**

(See Pipe Fittings.)

**COVERS, Automobile**

- Abercrombie, D. T. Co., 311 Broadway, N. Y. City.  
 Abercrombie & Fitch Co., 57 Reade St., N. Y. City.  
 ★ Ajax Trunk & Sample Case Co., 91-93 Mercer St., N. Y. City. (Trunk.)  
 Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. "Quality."  
 Blue Ribbon Auto & Carriage Co., Cannon St., Bridgeport, Conn.  
 Continental Waste Co., 22 Clayton St., Dorchester, Mass.  
 Duane, W. J. & Co., 230 W. 58th St., N. Y. City.  
 Dunham, D. B. & Co., 128-132 Irving St., Rahway, N. J.  
 Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.  
 Ford Auto Equipment Co., Inc., 1735 Michigan Ave., Chicago, Ill.  
 Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y.  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 Ideal Wind Shield Co., Inc., 1926 Broadway, N. Y. City.

# Gordon Covers Fit

It is the fit and finish of Gordon Covers that make them worth more money than covers of other makes.

We have devoted ten years to the manufacture and improvement of fine fabric goods.

Our aim has always been to pay particular attention to details and give full value, using only the best of materials and first-class workmanship. We offer a line of goods that will give service and satisfaction.

SEND FOR COMPLETE CATALOGUE



## GORDON EASY-ON TIRE COVER

This cover is what its name implies, the easiest cover to put on; cut and shaped to fit the tire perfectly; the only fastening necessary is at the ends, which overlap. The cover is drawn perfectly smooth and is fastened with buttons, and is therefore the Easy-On Cover.

The use of the several buttons allows of a considerable adjustment, and this cover will fit perfectly any and all makes of tires, round tread, flat tread, Bailey tread, etc., and will fit all makes of American and foreign patterns. This cover fits snug and smooth when the tire is new; also after the tire has been used; also after the tire has been retreaded, and this is something no other style cover will do.

We assure you this is the most satisfactory and economical tire cover on the market.



## GORDON FITS-ALL HEADLIGHT COVER

Will fit all headlights, flare front, with or without bale, bullet, and search or cylinder lamps, rigid or swinging bracket, better than any other lamp cover. Made in only 3 sizes. When ordering give diameter of front glass.

6 to 8 in. 8 to 10 in. 10 to 12 in.



## GORDON FITS-ALL SIDE AND TAIL LAMP COVER

Fits all sizes and makes of tubular and square lamps, gas or oil, and either side or tail lights. Made in 3 sizes. Small size fits lamps up to 12 inches in height; medium size up to 15 in.; large size up to 18 in. When ordering give height of lamp.



## GORDON INNER TUBE

Made so that the tubes can be put inside and tightly closed by means of glove fasteners, absolutely protecting them from oil, dust or injury of any kind. Saves the tourist a great deal of trouble from inner tubes while on tour.



## GORDON TOP HOOD

Keep your top lining from fading in the sun. Protect entire top from the dust, mud and water thrown up by the wheels, with a Gordon Top Hood. Fits

neatly and smoothly; top is always clean and ready to be put on. Hood prevents dust from coming up behind the machine, to the annoyance of the occupants of the rear seat. Only practical Top Hood, as any dealer will tell you. Have been making Hoods for ten years and have all the good features patented. Made in sizes, of Gordon rubber, artificial leather and mackintosh goods, the former being most popular.



## GORDON RUBBER INNER PATCH

This shoe will carry a 5-inch tire, with a 2½-inch blow-out, 1500 miles, without the use of an

outer shoe, and it will not creep or fail in any particular. What other shoe will do this?

Gordon Shoe is made of the finest Sea Island Fabric, the cotton for its production is combed and carded as in wool productions.

The shoe is built of various layers of Sea Island Fabric laid on the bias in the same scientific manner as the tire is built, and between each layer of Sea Island Fabric is a coat of Para rubber.

The outside of the Gordon Inner Shoe is coated with a heavy coating of Acra Flake Cement to get the sticking qualities. To apply the shoe wash the casing around the break with a little gasoline, to take out the soapstone and give a clean surface. The Gordon Shoe will then stick, its liberal size insures a perfect repair, and we guarantee it not to creep. The shoe can be taken out and used again and again.

Every tire shoe is packed in a separate box.

No. 1101 shoe is built of three layers of Sea Island Fabric; repairs 2½-inch and 3-inch tire.

No. 1102 shoe is built of four layers of Sea Island Fabric; repairs 3½-inch and 4-inch tire.

No. 1103 shoe is built of five layers of Sea Island Fabric; repairs 4½-inch and 5-inch tire.

These bands are to cover injured places in the tire; they make the tire last until you reach home and save trouble of changing on the road. Prevent "blow-outs" and save re-treading when tire is in good condition except at one place. A big economy. Made of Gordon leather, specially treated to make it tough and pliable; in six sizes to fit closely against the tire from end to end of the band; laces of rawhide lacing leather, holes for lacing being reinforced with brass gromets and guaranteed not to tear out. Plain or with rivets.

For Sale by All Jobbers and Dealers. Manufactured by

## THE VEHICLE APRON AND HOOD CO.

Office and Factory, Columbus, O.

Or 82 West Broadway, New York City

OUR LINE OF SUMMER ROBES AND DUSTERS NOW READY

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- King Top Mfg. Co., Main & First Sts., Dayton, O. "King."  
 Landers Bros. Co., Toledo, Ohio.  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."  
 National India Rubber Co., Bristol, R. I.  
 New England Auto Top Co., 128 W. 52nd St., N. Y. City.  
 Phelps, F. Z. Auto Top & Trimming Co., 1292 Niagara St., Buffalo, N. Y.  
 Raritan Woolen Mills, 14 White St., N. Y. City.  
 Rex Shield & Mfg. Co., Connerville, Ind. "Rex."  
 Rothschild & Co., 530-532 West 27th St., N. Y. City.  
 Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass.  
 ★Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, O. "Gordon."  
 Wiley, The Wm. H. & Son Co., Box No. 78, Hartford, Conn.  
 Wood, Frederick R. & Son, 217 W. 19th St., N. Y. City.

**COVERS, Engine**

- Gilliam Mfg. Co., The, Canton, Ohio. "Gilliam's."

**COVERS, Gear**

- Murdock-Shaw Co., 125 Federal St., Boston, Mass.

**COVERS, Lamp**

- ★Allen Auto Specialty Co., 1926 Broadway, N. Y. City. "Allen."  
 Bohnet, John & Co., 114 & 116 Grand Ave., South Lansing, Mich.  
 Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn.  
 Capital Auto Co., Indianapolis, Ind.  
 Delmar Auto Body & Wheel Co., Indianapolis, Ind.  
 Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.  
 Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y.  
 Gates-Osborne Mfg. Co., Marshalltown, Ia.  
 Gifford, John A. & Son, 25 Park Place, N. Y. City.  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 ★Hopewell Bros. 29 Chapel St., Newton, Mass. "Hopewell."  
 Landers Bros. Co., Toledo, O.  
 London Auto Supply Co., 2540-48 Wabash Ave., Chicago, Ill.  
 Myers Auto Top Co., The, S. E. Cor. First & St. Clair Sts., Dayton, O.  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."  
 Norris, R. Milton, 516-518 W. Baltimore St., Baltimore, Md.  
 Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill.  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. "Phoenix."  
 Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis. "The Racine."  
 Racine Mfg. Co., Racine, Wis.

- Rex Shield & Mfg. Co., Connerville, Ind. "Rex."  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon Fittsall."  
 Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo. (To order.)  
 Wiley, The Wm. H. & Son Co., Box 78, Hartford, Conn.

**COVERS, Magneto**

- Gilbert Mfg. Co., New Haven, Conn. "Gilbert." (Leather.)  
 Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City.  
 ★Mesinger, H. & F. Mfg. Co., 1801-03 First Ave., N. Y. City. (Auto & motorcycle.)  
 Perkins-Campbell Co., The, 622 Broadway, Cincinnati, O.  
 Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill.  
 Springfield Harness Co., 27-29 Dwight St., Springfield, O.  
 Sutherland, The F. L. Co., Detroit, Mich.  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon."

**COVERS, Motor Boat**

- Abercrombie, D. T. Co., 311 Broadway, N. Y. City.  
 Carpenter, Geo. B. & Co., 202-208 S. Water St., Chicago, Ill. (Canvas.)  
 Kenyon, The R. L. Co., Waukesha, Wis.  
 Lindley, W. H. Co., Main & Canal Sts., Canastota, N. Y. "Lindley."

**COVERS, Oil Hole**

(See Oil Hole Covers.)

**COVERS, Radiator**

- Gilliam Mfg. Co., The, Canton, Ohio. "Gilliam's."  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon."

**COVERS, Sprocket**

- New Britain Sheet Metal Co., New Britain, Conn.  
 Paragon Auto-Parts Co., The, 1709-1711 Broadway, N. Y. City.  
 Sheet Metal Auto Parts Works, 201 W. 48th St., N. Y. City.

★ indicates Advertisers—see Index in back of book.

## COVERS, Steering Knuckle

(See Grease Bags.)

## COVERS, Steering Wheel

Hayne-Surridge Auto Goods Co., 1017 Lucas Ave., St. Louis, Mo. "Eze-Grip." (Leather & rubber.)

Luzerne Rubber Co., Trenton, N. J. (Hard rubber.)

★Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, O. "Gordon."

Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.

Landers Brothers Co., Toledo, O. (Cotton.)

Mammoth Mfg. Co., White Plains, N. Y.

Modern Autop & Equipment Co., 607 St. Claire Ave., N. E., Cleveland, O. "Modern."

Peerless Buggy Top Co., S. W. Cor. Central Ave. & York St., Cincinnati, O.

Phelps, F. Z. Auto Top & Trimming Co., 1292 Niagara St., Buffalo, N. Y.

Racine Mfg. Co., Racine, Wis. (Seat covers.)  
Standard Auto Top Co., 239 W. 50th St., N. Y. City.

Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
U. S. Dash & Fender Co., 127 W. 49th St., N. Y. City.

Vetter Top Co., 49 & 51 W. 66th St., N. Y. City.

Western Auto Top Co., 1122-24 E. 15th St., Kansas City, Mo.

## COVERS, Trunk

★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."

★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon."

★Winship, W. W., 71 Summer St., Boston, Mass.

## CRANKS, Starting

Hilton Mfg. Co., 15 State St., Boston, Mass.  
"Hilton" (safety auto; rear for boats.)

Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.

Michigan Auto Parts Co., 1559-1561 Jefferson Ave., W., Detroit, Mich.

Stryker & Woessner, Huron, O. "S & W."

## COVERS, Universal Joint

★Allen Auto Specialty Co., 1926 Broadway, N. Y. City. "Allen."

★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.

Detroit Leather Works, 844 Woodward Ave., Detroit, Mich.

Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City.

Perkins-Campbell Co., The, 622 Broadway, Cincinnati, O.

Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill.

## CRANK CASES

Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich. "Autoart."

Cross Gear & Engine Co., 800-806 Bellevue Ave., Detroit, Mich.

Johnson & Jennings Co., 877 Addison Road, Cleveland, O.

Joliet Steam Forge Co., Joliet, Ill.

Rogers, C. E., 34 Beach St., Boston, Mass.

## CRANK HANDLES, Starting

Hellenberg, J. B. & Son, Coldwater, Mich.

Luzerne Rubber Co., Trenton, N. J. (Hard rubber.)

Stokes, Jas. Rubber Co., Trenton, N. J. (Hard rubber.)

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Abercrombie, D. T. Co., 311 Broadway, N. Y. City.

Auto Top & Body Co., 249 N. Watts St., Phila., Pa.

Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn.

Broadway Auto Top & Body Co., 136 W. 54th St., N. Y. City.

★Carr, F. S. Co., 113 Purchase St., Boston, Mass.

Columbia Auto Top Co., 17 Dwight St., Springfield, Mass.

Demar, J. E. Co., 244-48 W. 49th St., N. Y. City.

Diamond Auto Top Construction Co., 220 W. 48th St., N. Y. City.

Duane, W. J. & Co., 304 W. 54th St., New York, N. Y.

Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y.

Gerhah & Ludlain, 305 Cherry St., Phila., Pa.

Ideal Wind Shield Co., Inc., 1926 Broadway, N. Y. City.

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Feeser, Frank S. Co., 1104 Prospect St., Indianapolis, Ind. "Superior."

Gilbert Mfg. Co., New Haven, Conn. "Gilbert."

Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City.

★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."

Perkins-Campbell Co., The, 622 Broadway, Cincinnati, O. "Campbell." (Leather.)

Vaugier Mfg. Co., The, Piqua, O.

★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon."

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- A. & J. Mfg. Co., 427 W. Randolph St., Chicago, Ill. "A. & J."  
 ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Excelsior," & "Perfection."  
 Great Western Mfg. Co., La Porte, Ind. "Faulber."  
 Hart Mfg. Co., 370 Atlantic Ave., Boston, Mass. (Repair hanger, cycle.)  
 Stevens & Co., 375 Broadway, N. Y. City.

**CRANKSHAFTS**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 Anderson Forge & Machine Co., 21-31 St. Aubin Ave., Detroit, Mich.  
 Atlas Drop Forge Co., Lansing, Mich.  
 Auto Crank Shaft Co., 192-6 Piquette Ave., Detroit, Mich.  
 Barnett Drop Forging Co., East Hampton, Mass.  
 Eates Forge Co., Indianapolis, Ind.  
 ★Becker Steel Co., 2226-27 Land Title Bldg., Phila., Pa.  
 Bethlehem Steel Co., South Bethlehem, Pa.  
 Carpenter Steel Co., Rooms 1908-10, 100 Broadway, N. Y. City.  
 Chicago Drop Forge & Foundry Co., Kensington Station, Chicago, Ill.  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel, to order.)  
 Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.  
 Detroit Forging Co., Detroit, Mich.  
 Driggs-Seabury Ordnance Corporation, Sharon, Pa.  
 Erie Forge Co., Erie, Pa.  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.  
 Funk Engineering Co., 39-47 Fourteenth St., Hoboken, N. J.  
 ★Gill, P. H. & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.  
 Joliet Steam Forge Works, The, Joliet, Ill.  
 Krefeld Steel Co., 50 Church St., N. Y. City.  
 Krupp (Prosser & Son), P. O. Box 878, G. P. O., N. Y. City.  
 Leland, W. H. Mfg. Co., Worcester, Mass.  
 ★Massachusetts Machine Shop, Inc., 98 Beacon St., Worcester, Mass.  
 ★Michigan Crank Shaft Co., Muskegon, Mich.  
 ★Muskegon Motor Specialty Co., Muskegon, Mich.  
 National Engineering Co., Saginaw, Mich.  
 New Process Steel Co., The, 210 W. River St., Marshall, Mich. (Crucible steel.)  
 Norton Grinding Co., Barbers Crossing, Worcester, Mass.  
 Obenberger Drop Forge Co., 220-224 Lake St., Milwaukee, Wis.  
 Park Drop Forge Co., The, 730 E. 79th St., Cleveland, O.  
 Richmond Forgings Corporation, Richmond Va.  
 ★Standard Connecting Rod Co., Beaver Falls, Pa.  
 Sundberg, J. A. & Co., Kinzie & Carpenter Sts., Chicago, Ill.  
 Tindel-Morris Co., Eddystone, Pa.  
 Transue & Williams Co., The, Alliance, O.  
 Union Drop Forge Co., 64-76 E. Ohio St., Chicago, Ill.  
 Western Tool & Forge Co., Brackenridge, Pa.  
 Witteman, A. P. Co., 112-16 N. Broad St., Phila., Pa.  
 Wyman & Gordon Co., 30 Bradley St., Worcester, Mass.

**CUPS & CONES, Automobile Ball Bearing**

- Bauer Machine Co., Jeffersonville, Ind.  
 Bossert Co., The, Utica, N. Y. (Ball cups, to order.)  
 Columbia Steel Co., The, Elyria, O.  
 ★Corbin Screw Corporation, New Britain, Conn.  
 ★Crosby Co., The, 171-89 Pratt St., Buffalo, N. Y. (Cups.)  
 Ellis Mfg. Co., The, Milldale, Conn.  
 Hartford Machine Screw Co., The, Hartford, Conn. "Hartford."  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O. (Cups.)  
 Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich. "Peninsular."  
 Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.  
 Schewpe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich.  
 Stoll Pressed Steel Co., Buffalo, N. Y.  
 U. S. Automatic Co., Amherst, O.  
 Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass.

**CUPS & CONES, Cycle Ball Bearing**

- A. & J. Mfg. Co., 427 W. Randolph St., Chicago, Ill. "A. & J."  
 ★Corbin Screw Corporation, New Britain, Conn.  
 Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y.  
 Hart Mfg. Co., 370 Atlantic Ave., Boston, Mass.  
 Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.  
 Stevens & Co., 375 Broadway, N. Y. City. ("Criterion" cones & "Esco" cups.)  
 Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass.

**CUPS, Oil & Grease**

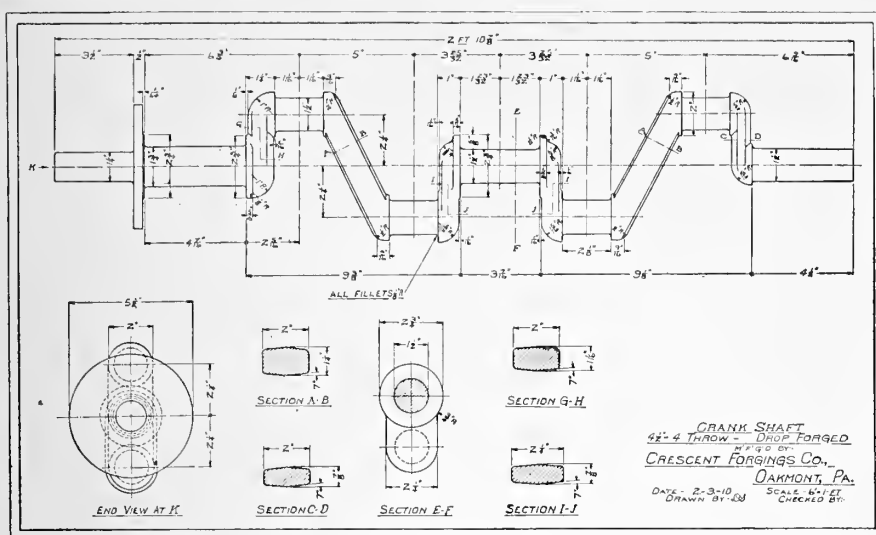
(See Oil Cups and Grease Cups.)

**CUPS, Priming**

(See Priming Devices.)

**CURRENT INDICATORS**

- Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."  
 Eldredge Electric Mfg. Co., 3 Post Office Square, Springfield, Mass. "Express."



A new crank shaft design, for which we are prepared to furnish forgings in large or small quantities. The sizes given are the sizes to which the shaft will finish.

## Crescent Forgings Company

OAKMONT, PA.

## The Back-Bone of the Power Plant,—the CRANKSHAFT



Are yours proving entirely satisfactory?

You know it doesn't pay to take chances with such an important part of a car, so if you have your doubts about your present equipment, better be on the safe side and make sure of getting the best that can be made.

It is a matter of pride with us that we are supplying the largest and best automobile manufacturers in the country, and we unhesitatingly guarantee our **Crankshafts** to be true to drawing, and beyond reproach in quality, durability and strength.

May we have an opportunity of submitting estimates?

**Standard Connecting Rod Co., Beaver Falls, Pa.**



**CURRENT INDICATORS—Continued**

- Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radium."  
 Robert Instrument Co., The, 56 Shelby St., Detroit, Mich. "Robert."  
 Westchester Appliance Co., 13-15 Canal Place, Bronx, N. Y. City.  
 ★Westinghouse Electric & Mfg. Co., Pittsburg, Pa.

**CURTAINS, Auto & Boat**

- (See also Top Manufacturers.)  
 Boyle, John & Co., 112-14 Duane, St., N. Y. City.  
 Cisler & Serson, 3111 Michigan Ave., Chicago, Ill.  
 National Lock Washer Co., 65 Johnson St., Newark, N. J. "National."  
 Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis. (Auto, side.)  
 Sloane, W. & J., 19th St. & Broadway, N. Y. City. (Auto.)

**CURTAIN CASES**

- American Vulcanized Fibre Co., 500 Equitable Bldg., Wilmington, Del. (Fibre.)  
 Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City. (Leather.)  
 Gates-Osborne Mfg. Co., Marshalltown, Ia.  
 Rex Shield & Mfg. Co., Connersville, Ind. "Rex."  
 ★Winship, W. W., 71 Summer St., Boston, Mass.

**CURTAIN FASTENERS**

- Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich. (Curtain hooks.)  
 ★Auto Specialties Mfg. Co., Inc., 811-816 Unity Bldg., Chicago, Ill. "Bair."  
 ★Broga Automatic Fastener Co., 368 W. Fayette St., Syracuse, N. Y. "Broga."  
 Carr Fastener Co., 145 High St., Boston, Mass. "Lift Up."  
 Cisler & Serson, 3111 Michigan Ave., Chicago, Ill.  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "Brewster," "Ideal," "Perfect," "Success" & "Excelsior."  
 Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
 Curtain Supply Co., The, 320 W. Ohio St., Chicago, Ill.  
 English & Mersick Co., 122-26 Winchester Ave., New Haven, Conn. (Auto.)  
 English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.  
 Enterprise Brass & Plating Co., The, Cincinnati, O. "Monarch."  
 Enterprise Supply Co., The, 501 Commercial National Bank Bldg., Chicago, Ill. "Tesco."  
 Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill.  
 Globe Brass Works, 15-17 Macomb St., Detroit, Mich. ((Brass hooks.)  
 Goshen Eyelet Co., Goshen, Ind.  
 Hershey Hook Co., Lincoln, Neb. "Hershey."  
 Higgin Mfg. Co., Newport, Ky. "Higgin."  
 ★Jonah & George, Merrimac, Mass.

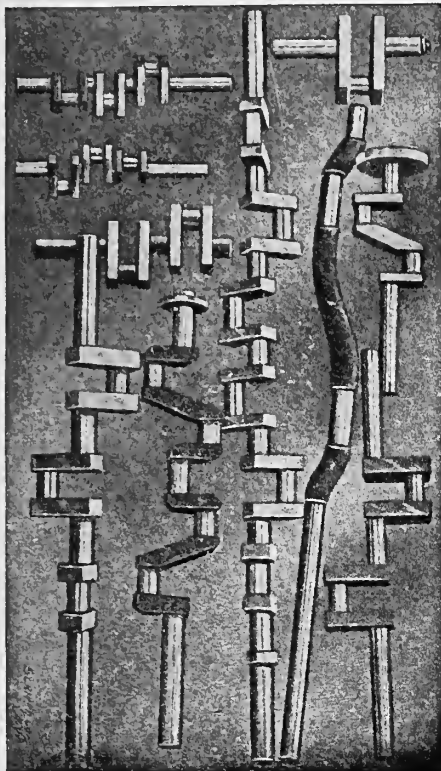
- L. & D. Co., The, 88 Broad St., Boston, Mass. "Jitsu."  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Peerless," "Perfection," "Brewster" & "Adjustable."  
 Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O.  
 Murphy, The G. W. J. Co., Merrimac, Mass. "Murphy."  
 National Lock Washer Co., 65 Johnson St., Newark, N. J. "National."  
 Neider, F. A. Co., Augusta, Ky. (Brass.)  
 Roehm & Davidson, Ltd., Detroit, Mich. (Brass.)  
 ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich. "Reliable."  
 Standard Top & Equipment Co., 1206-12 Huron Rd., S. E., Cleveland, O. "Swan."  
 Strong, M. H., 168 South Ave., Rochester, N. Y.  
 Taylor, H. D. Co., 101-105 Oak St., Buffalo, N. Y.  
 United States Fastener Co., 95 Milk St., Boston, Mass.  
 Weiss, Chas. & Son, 4800 Cottage Grove Ave., Chicago, Ill. "Weiss."  
 Woodruff, Walter W. & Sons Co., Mt. Carmel, Conn.

**CURTAIN ROLLERS**

- Carey & Company 241-45 Arch St., Phila., Pa. "Edw. Reukauf."  
 Spring Perch Co., 232 John St., Bridgeport, Conn. (Automatic.)

**CUSHIONS, Seat**

- Abercrombie, D. T. Co., 311 Broadway, N. Y. City. (Auto & motor boat.)  
 American Sanitary Mattress Co., N. W. Cor. 6th & Huntingdon Sts., Phila., Pa.  
 Anderson, F. W. & Co., Brown & Ueber Sts., Phila., Pa.  
 Bauer Bros. Mfg. Co., Richmond & Carr Sts., Cincinnati, O.  
 Canastota Couch Co., Canastota, N. Y. (Boat.)  
 Chicago Flag & Decorating Co., 350-52 Wabash Ave., Chicago, Ill. "Never Sink." (Boat pillows & cushions.)  
 Columbia Auto Top Co., 17 Dwight St., Springfield, Mass. (Auto.)  
 Delmar Auto Body & Wheel Co., Indianapolis, Ind.  
 Everitt, The B. F. Co., 506 Clay Ave., Detroit, Mich.  
 Fine Woolen Co., 58 & 60 Worth St., N. Y. City. (Boat.)  
 Fogg, M. W., 202 Front St., N. Y. City. (Motor boat.)  
 Frank, W. H., 22 Harrison St., New Rochelle, N. Y. (Motor boat.)  
 Harlow, Willard Mfg. Co., Janesville, Wis. "Harlow."  
 Hawes Storm Front Co., 25 N. Hanchett St., Coldwater, Mich. (Boat.)  
 Hill Mfg. Co., The, 25-27 Fuller St., Buffalo, N. Y. "Hill."



## **GILL FORGED CRANK-SHAFTS**

The P. H. Gill & Sons Forge and Machine Works, Lorraine and Otsego Streets, Brooklyn, N. Y. We wish to call the Trade's attention to our Chrome Nickel Steel Crank-Shafts and Gear Blanks, etc., Domestic and Foreign.

### **NO DROP FORGINGS**

We have special adapted Crank Pin Machines for making Crank-Shafts true-round within one-quarter-thousandth of an inch. We also make axles complete, finished or forged only; also all kinds of automobile and marine forgings.

Crank-shafts up to 6" dia. All anvil-forged, hammered out of Acid O. H. Steel or Nickel Steel or Chrome Nickel Steel.

Do not be Deceived by Something only Half as Good, but get the Genuine

## **J. & G. FASTENER**

(PATENTED)

### **The Only Positive Automobile Curtain Fastener**

Manufacturers of HANDLES, CURTAIN FASTENERS, SEPARATORS, BOW RESTS, SLAT IRONS and BRASS SPECIALTIES, also BRASS MOLDING

JONAH & GEORGE :: :: MERRIMAC, MASS.



**MASSACHUSETTS MACHINE SHOP INC.**  
98 & 100 BEACON ST.  
WORCESTER, MASS.



We make a Specialty of Grinding and Finishing Crankshafts.

Send Blue-print for Quotation on your Requirements.

Tool and Die Work for all kinds of Sheet Metal Stamping.



**CUSHIONS, Seat—Continued**

- ★Hopewell Bros., 29 Chapel St., Newton, Mass. (Auto pillows.)  
 Jackson Cushion Spring Co., Jackson, Mich. (Cushion frames.)  
 Jacobsen, Chas. M., 52 Woodward Ave., Detroit, Mich. (Motor boat.)  
 Lindley Co., W. H., Main & Canal Sts., Canastota, N. Y. "Lindley." (Motor boat.)  
 ★National Spring & Wire Co., Albion, Mich. (Spring edge cushion frames.)  
 Norris, R. Milton, 516-518 W. Baltimore St., Baltimore, Md.  
 Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill. (Spring.)  
 Peerless Buggy Top Co., S. W. Cor. Central Ave. & York St., Cincinnati, O. (Auto & boat.)  
 Pneumatic Mfg. Co., The, 2 & 3 South St., New York, N. Y. (Pneumatic motor boat.)  
 Reardon, J. J., Amesbury, Mass.  
 Sloane, W. & J., 19th St., & Broadway, N. Y. City.  
 Truscott Boat & Auto Supply Co., St. Joseph, Mich. (Boat.)  
 Tufting Machine Supply Co., 1200 Michigan Ave., Chicago, Ill.  
 ★Winship, W. W., 71 Summer St., Boston, Mass.

**CUSHION FILLINGS**

- Armour Curled Hair Works, 31st Pl. & Benson St., Chicago, Ill. (Curled hair.)  
 Baeder, Adamson & Co., 67 Beekman St., N. Y. City. (Curled hair.)  
 Becker, Chas. W., Amsterdam, N. Y. "Becker." (Goat hair, jute cotton & wool batting for filling cushions.)  
 Bentley, Joseph Hair Co., Methuen, Mass. (Curled hair.)  
 Delany & Co., 209 N. Third St., Phila., Pa. (Curled hair.)  
 Gordon Bros. Co., Inc., Pierce & Orthodox Sts., Phila., Pa. (Curled hair.)  
 Lounsbury, G. H. & Sons, 107-109 W. Third St., Cincinnati, O. (Curled hair, imported.)  
 Mitchell, P. R. Co., The, Harrison & Spring Grove Ave., Cincinnati, O. (Sterilized curled hair.)  
 ★Paddock Cork Co., 1299-17 De Kalb Ave., Brooklyn, N. Y. (Cork shavings for boat cushions.)  
 Wilkens, Wm. Co., Frederick Ave., & Wilkens St., Baltimore, Md. (Curled hair.)  
 Woll, Peter & Sons Mfg. Co., Hancock & Berks Sts., Phila., Pa. (Curled hair.)

**CUT-OUTS, Muffler**

(See Muffler Cutouts.)

**CUT-OUT PEDALS**

(See Pedals.)

**CUTTING COMPOUNDS**

- Franklin Oil Works, Franklin, Pa. "Franklin."  
 General Oil Works Co., Traction Bldg., Indianapolis, Ind. "Reliable."  
 Houghton, E. F. & Co., 240 W. Somerset St., Phila., Pa. "Houghton's."  
 Lynch, Alonzo K., Inc., 310-12 Flushing Ave., Brooklyn, N. Y. "Advance."  
 Mohawk Grinding Paste Mfg. Co., Box 608, Schenectady, N. Y. "Mohawk." (Paste.)  
 Monahan Antiseptic Co., 100 Market St., Chicago, Ill. "Green Oil."  
 White Refining Co., 77 Main St., Buffalo, N. Y. ("Scientific"; also "Buffalo" & "Austrian" cutting oil.)  
 White Star Refining Co., 307 White Bldg., Boston, Mass. "Star A."

**CYCLE MOTORS**

- Armac Motor Co., 472 Carroll Ave., Chicago, Ill. "Armac."  
 ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor."  
 Bradley Motor Co., 268 Diamond St., Phila., Pa. "Bradley."  
 Climax Electric Works, New Salem, Mass.  
 Eagle Motor Works, 1111 East Franklin St., Minneapolis, Minn. "Eagle."  
 ★Excelsior Supply Co., 233 Randolph St., Chicago, Ill.  
 Geer, Harry R. Co., 856 McLaren St., St. Louis, Mo.  
 ★Harley-Davidson Motor Co., 3800 Chestnut St., Milwaukee, Wis.  
 ★Herring-Curtiss Co., Hammondsport, N. Y. "Curtiss."  
 Hilaman, A. L. Co., Moorestown, N. J. "Hilaman."  
 Keller & Risque Motor Co., The, 20 W. 3rd St., St. Paul, Minn. "K & R."  
 Kiefler Motor Works, 184 Broadway, Buffalo, N. Y. "Kiefler."  
 Marvel Motorcycle Co., Hammondsport, N. Y. "Marvel."  
 Merkel-Light Motor Co., The, Pottstown, Pa. "Merkel."  
 ★Motor Cycle Equipment Co., Hammondsport, N. Y. "Erie."  
 Prospect Motor Co., 1900 Broadway, N. Y. City. "Peugeot" & "Buchet." (Imported.)  
 ★Reading Standard Co., Reading, Pa.  
 ★Reliance Motor Cycle Co., Owego, N. Y.  
 Riley Bros., Bridgeton, N. J. "Riley."  
 Shaw Mfg. Co., Galesburg, Kansas. "Shaw." (Complete outfit for bicycles.)  
 Stenzy, A. F. P., 1019 Binney St., Baltimore, Md. "Stenzy's."  
 Thiem Mfg. Co., The, Minneapolis, Minn. "Thiem."

**CYCLOMETERS**

- Veeder Mfg. Co., Sargeant & Garden Sts., Hartford, Conn. "Veeder."

**CYLINDER CASTINGS**

(See Castings, Grey Iron.)

**CYLINDER CLEANING COM-  
POUNDS**

(See Carbon Removers.)

**DECALCOMANIA**

(See Transfers.)

**CYLINDER OIL**

(See "Oils.")

**DECARBONIZERS**

(See Carbon Removers, Liquid.)

**DASHES**A-Z Co., The, 527-29 W. 56th St., N. Y. City.  
"A-Z." (Metal.)Acme Veneer & Body Co., Rahway, N. J.  
Alpinus-Haggstrom Mfg. Co., 1502 Michigan  
Ave., Chicago, Ill. (Metal.)American Veneer Co., 100 Market St., Kenil-  
worth, N. J.Auto Sheet Metal Works, 2228 Michigan Ave.,  
Chicago, Ill. (Metal.)

Bennett Mfg. Co., Aiden, N. Y. (Metal.)

Briscoe Mfg. Co., 1427-57 Woodward Ave., De-  
troit, Mich.Bush Mfg. Co., 81 Commercial St., Hartford,  
Conn.Clayton, Frank B. Sons, 1222-24 Race St.,  
Phila., Pa. (Metal.)Dann Bros. & Co., The, 80-86 Franklin St.,  
New Haven, Conn. (Wood.)Dayton Body Co., 618-24 Geyer St., Dayton, O.  
Detroit Auto Specialty Co., 909 Greenwood  
Ave., Detroit, Mich.Dunham, D. B. & Co., 128-132 Irving St., Rah-  
way, N. J.★Globe Machine & Stamping Co., The, 3950  
Hamilton Ave., N. E., Cleveland, Ohio.  
(Metal.)Hanson-Ward Veneer Co., Bay City, Mich.  
(Wood.)Hayes Mfg. Co., Maybury Grand Ave. & G. T.  
Ry., Detroit, Mich.Holland Veneer Works, Holland, Mich.  
(Wood.)Indianapolis Dash Co., 2116-18 S. Meridian St.,  
Indianapolis, Ind. (Leather.)Jamestown Panel & Veneer Co., Jamestown,  
N. Y. (Wood.)Kells, W. J. Mfg. Co., 726-28 Eleventh Ave.,  
N. Y. City.Kelsey, Herbert Co., 277-291 Monroe Ave.,  
Detroit, Mich.Kinsey Mfg. Co., Toledo, Ohio. "Kinwood."  
(Pressed steel.)Kundtz, Theodore, Cleveland, O. "Kundtz."  
(Wooden.)★La Porte Carriage Co., La Porte, Ind. "La  
Porte."★Long Mfg. Co., 1430-34 Michigan Ave., Chi-  
cago, Ill.McKinnon Dash Co., Amherst St., Buffalo, N.  
Y. "McKinnon."

Mullins, W. H. Co., Salem, O. (Metal.)

New Britain Sheel Metal Co., New Britain,  
Conn.

Noye Mfg. Co., Buffalo, N. Y. (Metal.)

Racine Mfg. Co., Racine, Wis.

Reliable Radiator Co., Inc., 451 E. 173rd St.,  
N. Y. City.★Smith, A. O. Co., Park, Clinton & Virginia  
Sts., Milwaukee, Wis. (Pressed steel.)Standard Cabinet Mfg. Co., Peru, Ind.  
(Wood.)

Stoll Pressed Steel Co., Buffalo, N. Y. (Metal.)

U. S. Dash & Fender Co., The, 127 W. 49th St.,  
N. Y. City.

Wayne Cabinet Co., Detroit, Mich.

Wilson, C. R. Body Co., Detroit, Mich.

Wood, Frederick R. & Son, 218 W. 19th St.,  
N. Y. City.Wright Cooler & Hood Mfg. Co., 1545 Michi-  
gan Ave., Chicago, Ill.**DEMOUNTABLE RIMS**

(See Rims, Demountable.)

**DESIGNERS, Auto**

(See Engineers &amp; Designers.)

**DESIGNS, Motor Boat**Whittelsey & Whittelsey, Inc., 11 Broadway,  
N. Y. City. (Steam & motor yachts &  
commercial vessels.)Willard, Walter C., 7617 Quincy Ave., Cleve-  
land, O. (Designs for internal combus-  
tion engines.)**DETACHABLE RIMS**

(See Rims, Removable.)

**DIALS**Electro-Chemical Engraving Co., 450-458 18th  
St., Brooklyn, N. Y. (Clock & meter.)Etching Co. of America, 2526-28 W. Congress  
St., Chicago, Ill. (Ammeter, voltmeter,  
annunciator, clock, gasoline gauge, spec-  
dometer, taximeter, etc.)Newark Brass Plate Engraving Co., 45-49  
Lawrence St., Newark, N. J.**DIE CASTINGS**

(See Castings, Die.)

★ indicates Advertisers—see Index in back of book.

## DIFFERENTIAL GEARS

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 ★Boston Gear Works, Norfolk Downs, Mass.  
 Brown-Lipe-Chapin Co., Syracuse, N. Y.  
 Bultman, The, F. H. Co., 2108 Superior Ave., N. W., Cleveland, O. "Bultman."  
 Continental Engine Co., Chicago, Ill.  
 Cross Gear & Engine Co., 800-806 Bellevue Ave., Detroit, Mich.  
 ★Cullman Wheel Co., 1340 E. Greenwood Terrace, Chicago, Ill. "Cullman."  
 F. R. V. Sales Co., The, Thoroughfare Bldg., N. Y. City. "F.R.V." (Gearless.)  
 Fish Systems Co., The, Indianapolis, Ind. "Fish Systems."  
 ★Frost Gear & Machine Co., Jackson, Mich.  
 Ganschow, Wm. Co., Washington Blvd. & Morgan St., Chicago, Ill.  
 Graham, Geo. H., 740 Monadnock Bldg., Chicago, Ill. "Graham." (Double drive.)  
 Metal Products Co., 226 Abbott St., Detroit, Mich.  
 Muncie Gear Works, Muncie, Ind. "Muncie."  
 New England Gear Works, 100 Purchase St., Boston, Mass. "N. E."  
 ★New Process Raw Hide Co., The, 500 Plum St., Syracuse, N. Y. "New Process."  
 ★New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.  
 Oswald Motor Co., Goshen, Ind.  
 Providence Engineering Works, 521 S. Main St., Providence, R. I.  
 Quride Co., 1417 N. Salina St., Syracuse, N. Y. "Quride."  
 Ross Gear & Tool Co., Main & 9th Sts., La-Fayette, Ind. "Ross."  
 Russel Wheel & Foundry Co., Detroit, Mich.  
 ★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal.  
 Van Dorn & Dutton Co., 2714 E. 79th St., Cleveland, O.

Vulcan Gear Co., 820 Warren Ave., W., Detroit, Mich.

Wabash Gear Works, Terre Haute, Ind.

★Warner, T. W. Co., Muncie, Ind.

★Warner Gear Co., Muncie, Ind. "Warner."

★Warner Mfg. Co., Toledo, O.

## DISCS, Steel Clutch

(See Clutch Discs.)

## DISCS, Radiator

(See Radiator Parts.)

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- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.  
 Altemus Mfg. Co., The, 42nd & Chestnut Sts., Phila., Pa. "Ideal."  
 American Electric Fuse Co., Muskegon, Mich. "American Igniter."  
 ★Atwater-Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa. "Spark Generator" & "Unisparker." (Coil, distributor and contact maker.)  
 Auto & Power Appliance Co., The, 357-359 The Arcade, Cleveland, O.  
 Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."  
 Crouse-Hinds Co., 308 W. Jefferson St., Syracuse, N. Y. "Crouse-Hinds."

# Cut Gears

and

# Complete Differentials

**Q** We have one of the best equipped plants in the world for turning out accurately cut gears of any kind, and material in any quantity.

Have 75 gear-cutting machines and the proper lathe equipment for keeping them busy. Our hardening plant contains six furnaces equipped with a pyrometer system.

**Q** We make two sizes of complete Differentials for motors up to 4½" bore.

THE

# New Process Raw Hide Co.

SYRACUSE, N. Y.

# GET RIGHT ON YOUR IGNITION



Specify the B. & S. Igniter on your new car, or to replace the out-of-date system on your old car when it is overhauled.

So simple and compact that it can be attached to any motor with trifling expense.

Always operates at **maximum** efficiency regardless of motor speed.

Will give better results than **any** magneto at one third the cost.

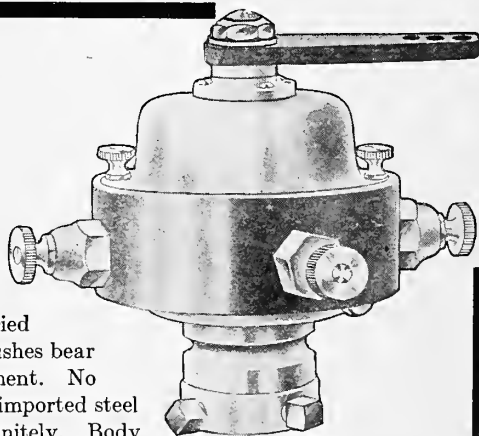
It's worth investigating.

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**BRIGGS & STRATTON CO.**  
MILWAUKEE                    ::                    WISCONSIN

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## Seeley Circuit Controller



### **A Mechanical and Electrical Masterpiece.**

Low tension distributor, built on time-tried principle of electric motor commutator. Brushes bear upon smooth, hard, steel ring with insulated segment. No burning possible. Bearings equipped with finest imported steel balls. Adjustable cones for taking up wear indefinitely. Body does not rotate for advance and retard. No twisting of cables and breaking of terminals. Decidedly the best controller for your car.

**The Seeley Ignition System** eliminates vibrators. Exerts more explosive action on gases. Saves battery energy and fuel. Average battery draught, one-fourth ampere. Ignites every charge with certainty. Absolutely accurate timing at all speeds. Nothing to wear out. Cannot burn out. Saves time, trouble and money. Adopted for 1910 by manufacturers of such high-class cars as the Columbia. Write for illustrated booklet.

**SEELEY SPECIALTIES COMPANY**  
129 East 9th St., Los Angeles, Cal.  
Pacific Coast Distributors

**SEELEY SALES CORPORATION**  
872 Woodward Ave., Detroit, Mich.  
Eastern Distributors

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- Eisner, Harry & Co., 29 Scotia St., Boston, Mass. "Eisner."  
 Enterprise Machine Co., 1114-22 S. Third St., Minneapolis, Minn. "Westman."  
 Foss, M. L., 1729 California St., Denver, Colo.  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Herz."  
 Leece-Neville Co., Cleveland, O.  
 ★Lehman, J. H. Mfg. Co., 500 5th Ave., New York City. "Lehman."  
 Luzerne Rubber Co., Trenton, N. J. (Hard rubber.)  
 Mica Core Mfg. Co., 442 E. 166th St., New York, N. Y. "Raves."  
 ★Mosler, A. R. & Co., 163 W. 29th St., N. Y. City. "Mosler" & "Umph."  
 Pfanstiehl Electrical Laboratory, North Chicago, Ill.  
 Philadelphia Timer & Machine Co., 328 Vine St., Phila., Pa. "Velos."  
 ★Pittsfield Spark Coil Co., Dalton, Mass. "Pittsfield" (also "Acme" combined timer and distributor.)  
 Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn. "Leavitt."  
 Waterhouse Co., The, 6 Pelham St., Boston, Mass. "Monitor."  
 Wilkie Rubber Mfg. Co., Lynn, Mass. (Hard rubber.)

- ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "Rankin," "Richmond," "Review," "Raritan" & "Roulette."  
 Fowler Lamp & Mfg. Co., 2335 Wabash Ave., Chicago, Ill.  
 Guide Motor Lamp Mfg. Co., 2069 E. Fourth St., Cleveland, O. "Guide." (Electric.)  
 Holt & Beebe, 40 Sudbury St., Boston, Mass.  
 Motor Car Equipment Co., 55 Warren St., N. Y. City.  
 Parry, A. N. & Co., Amesbury, Mass.  
 ★Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City.  
 Strong, M. H., 168 South Ave., Rochester, N. Y.  
 Taylor, H. D. Co., 101-105 Oak St., Buffalo, N. Y.  
 Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill.  
 ★White Mfg. Co., 155 Cannon St., Bridgeport, Conn.

**DOOR HANDLES**

(See Hardware.)

**DOME LIGHTS**

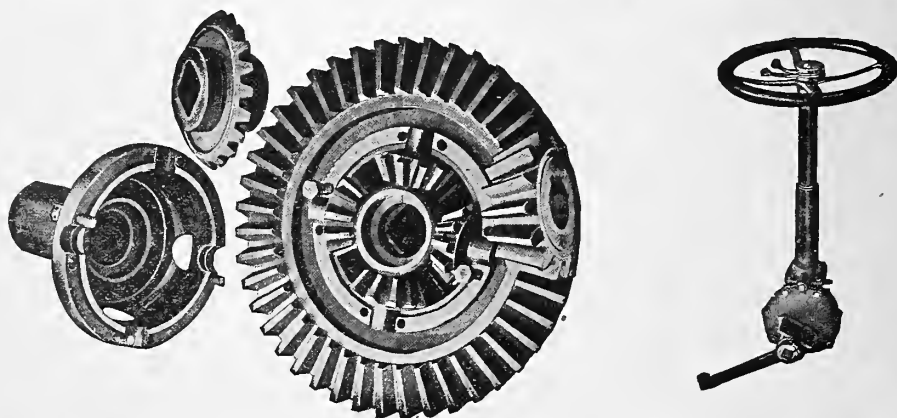
Alexander, The J. Co., 1931 Broadway, N. Y. City.

**DOOR HINGES**

(See Hardware.)

# BROWN-LIPE GEARS

## Transmission—Differential—Steering



Timken roller bearings are used as our regular equipment for transmissions.  
 Direct Factory Salesmen:—K. Franklin Peterson, 186 Lake St., Chicago, Thomas J. Wetzel, 29 W. 42nd St., New York City.  
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 Eastern Sales Agents:—Post & Lester Co., Hartford, Conn.

**Brown-Lipe Gear Co., 206 S. Geddes St., Syracuse, N. Y.**



## DOOR LOCKS

(See Hardware.)

## DOWEL PINS

Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, O. "Fitwell." (Brass.)  
Diamond Clamp & Flask Co., Richmond, Ind. "Diamond."  
Winkley Co., The, 226 Abbott St., Detroit, Mich. "Winkley."

## DRIP COCKS

(See Cocks.)

## DRIP PANS, Automobile

(See Dust & Mud Shields.)

## DROP FORGINGS

(See Forgings.)

## DRY BATTERIES

(See Batteries, Ignition, Dry.)

## DUSTERS

(See Clothing.)

## DUST DEFLECTORS, For Rear of Car

Brown, Will H., Schofield Bldg., Cleveland, O.  
Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.  
Ford Auto Equipment Co., Inc., 1735 Michigan Ave., Chicago, Ill.

## DUSTING DEVICES, Pneumatic

Electric Motor Equipment Co., 232 Market St., Newark, N. J. "Universal."

## DUST LAYERS

Barrett Mfg. Co., 17 Battery Place, N. Y. City. "Tarvia."  
Indian Refining Co., Cincinnati, O.

## DUST & MUD SHIELDS

A-Z Co., 527-29 W. 56th St., New York, N. Y.  
Amesbury Metal Body Co., Amesbury, Mass. (Metal.)  
Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. (Dust boots.)  
Auto Radiator Repairing Co., 1317 Vine St., Phila., Pa.  
Berger Mfg. Co., Canton, O.  
Bohnert, John & Co., 114-116 Grand Ave., S., Lansing, Mich.  
Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Metal.)  
Bush Mfg. Co., 81 Commercial St., Hartford, Conn.  
Clayton's Sons, Frank B., 1222-24 Race St., Phila., Pa.  
★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y. (For brake drums.)  
★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.  
Folsom, C. G. Mfg. Co., South Bend, Ind.  
★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O.  
Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich.  
Hill Dryer Co., 344 Park Ave., Worcester, Mass.  
Kells, W. J. Mfg. Co., 726-28 Eleventh Ave., N. Y. City.  
Kilbourne & Jacobs Mfg. Co., Congress & Lincoln Sts., Columbus, O. "K. & J."  
Kinsey Mfg. Co., Toledo, Ohio. "Kinwood." (Pans.)  
Metal Stamping Co., Jackson, Mich.  
Mullins, W. H. Co., Salem, O. (Metal.)  
New Britain Sheet Metal Co., New Britain, Conn.  
Novelty Mfg. Co., Jackson, Mich. "Novelty."  
Paragon Auto-Parts Co., The, 1709-1711 Broadway, N. Y. City.  
Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City. (Metal.)  
Reliance Auto Parts Mfg. Co., 244-50 W. 49th St., N. Y. City.  
Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O.

## DYNAMOS, Ignition

★Apple Electric Co., 20 N. Canal St., Dayton, O. "Apico."  
Atkin-Wheeler, Halesite, Huntington Harbor, L. I., N. Y. "A-W."  
Carlisle & Finch Co., 229 E. Clifton Ave., Cincinnati, O.  
★Dayton Electrical Mfg. Co., The, 89 St. Clair St., Dayton, O. "Apple."  
Elbridge Electrical Mfg. Co., Elbridge, N. Y. "Elbridge."  
Engineering Specialty Co., Stamford, Conn.  
Goddard, R. W. Co., 15 Abbott St., Worcester, Mass.  
★Holtzer-Cabot Electric Co., The, Boston, Mass. "Motsinger Auto-Sparker."  
Knoblock-Heideman Mfg. Co., The, South Bend, Ind. "Quick Action."  
Menominee Electric Mfg. Co., Menominee, Mich. "Menominee."  
Motsinger Device Mfg. Co., Pendleton, Ind. "Auto-Sparker."  
Ohio Electric Works, 6304 Ellen Ave., N. W., Cleveland, O. "Ohio."  
Western Electric Co., The, 465 West St., New York, N. Y. "Hawthorne."

## DYNAMOS, Lighting Auto

- Adams & Westlake Co., 319 Ontario St., Chicago, Ill. "Adlake-Newbold."  
 ★Apple Electric Co., 20 N. Canal St., Dayton, Ohio. "Aplco."  
 Gray & Davis, Amesbury, Mass.  
 ★Holtzer-Cabot Electric Co., The, Boston, Mass.  
 Motsinger Device Mfg. Co., Pendleton, Ind.  
 ★Willard Storage Battery Co., Marquette Rd., & Lakeside, Cleveland, O. "Elba."

## ELBOWS, Pipe

(See Pipe Fittings.)

## ELECTRICAL SUPPLIES

- Bacon & Hancock, 715 Congress Ave., Austin, Texas.  
 Bunnell, J. H. & Co., 20 Park Place, N. Y. City.  
 Manhattan Electrical Supply Co., 17 Park Pl., N. Y. City.  
 Pettingell-Andrews Co., 156-160 Pearl St., Boston, Mass.  
 Stanley & Patterson, 23 Murray St., N. Y. City.

## ELECTRIC LIGHTING SYSTEMS, Auto

- ★Apple Electric Co., 20 N. Canal St., Dayton, Ohio. "Aplco."  
 White Diamond Co., Indianapolis, Ind.

## ELECTRIC MOTORS, For Automobiles

- Elwell-Parker Electric Co. of America, 4222 Hamilton St., Cleveland, O.  
 ★General Electric Co., Schenectady, N. Y. "G.E."  
 Manlius Motor Co., Manlius, N. Y. "Niagara."  
 ★Westinghouse Electric & Mfg. Co., Pittsburg, Pa. "Westinghouse."

## ELECTRIC WELDING

(See Welding.)

## ELECTROLYTE

(See Battery Acid.)

## EMERGENCY CASES

(See Miscellaneous Articles.)

## ENAMELS

- Acme White Lead & Color Works, Detroit, Mich. "Ti-Ki."  
 Adams & Elting Co., 159-163 Washington Blvd., Chicago, Ill. "Ad-el-ite."  
 Akron Varnish Co., Akron, O. "Peerless" & "Akron."  
 American Enamel Co., Providence, R. I. "Bright Jet."  
 American Lacquer Co., The, Bridgeport, Conn.  
 Anderson Varnish Co., 3214 Sheffield Ave., Chicago, Ill. (For leather.)  
 Binswanger, B. & Co., 115 N. Fourth St., Phila., Pa.  
 Buffalo Enamel & Stain Co., Lord, Clinton & James St., Buffalo, N. Y. "Becco."  
 Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y. (Baking.)  
 Chicago Varnish Co., 2100 Elston Ave., Chicago, Ill. (Baking.)  
 Essex Varnish Co., 92 Vesey St., Newark, N. J. (Baking.)  
 Flint Varnish Works, Flint, Mich.  
 Flood & Conklin Co., Newark, N. J.  
 Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, Ohio. "Forest City."  
 Fry, Keyser, 723-25 Chestnut St., Reading, Pa. "Ever Right."  
 Glidden Varnish Co., Cleveland, Ohio.  
 Holland Enamel & Paint Co., 142 Fulton St., N. Y. City. "Union" & "Holland." (Also "Hepeco" imported.)  
 Johnston Paint Co., 226 Main St., Cincinnati, O. "Dull Tone Enamel." (Yacht.)  
 Lowe Bros. Co., The, Dayton, O. "Linduro." (For Boats.)  
 Lucas, John & Co., Phila., Pa. "Lucas."  
 Masury, J. W. & Son, 44 Jay St., Brooklyn, N. Y.  
 Moller & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y. (Baking.)  
 Smith, Edward & Co., 129 West Ave., Long Island City, N. Y.  
 Standard Varnish Works, 29 Broadway, N. Y. City.  
 ★Tingley, Chas. O. & Co., Rahway, N. J. "C. O. T." (Aluminum lacquer.)  
 ★Valentine & Company, 257 Broadway, N. Y. City. Also 277 Dearborn St., Chicago, Ill. "Valentine."  
 Wadsworth-Howland Co., 84 Wash St., Boston, Mass. "W. H. & Co." (Engine.)

## ENGINES, Gasoline

(See Gasoline Auto Motors & Marine Gasoline Motors.)

## ENGINES, Kerosene

(See Kerosene Marine Motors.)



The Elba system is several years in advance of any other method of generating, storing, distributing and utilizing electricity for automobile lighting and ignition. The Elba System is backed by nineteen years' experience in making identical systems for railroad train lighting.

# ELECTRIC

lighting is revolutionizing automobile illumination, just as it has in the past displaced all other methods in the lighting of homes, offices, factories, trains, steamships, etc. Automobile electric lighting has, until recently, been impractical because of inadequate equipment. The Elba System is the first complete system for both electric

# LIGHTING

and ignition of automobiles. The complete Elba System consists of a self-regulating generator, storage battery, ampere meter, switch, Elba lamps and Tungsten bulbs. The Elba generator maintains the same voltage at 500 R. P. M. or at any higher speed without governors or other devices. Straight storage systems without the generator can be used but are not so powerful nor convenient. Every part of the Elba

# SYSTEM

and equipment is refined to the highest state of perfection. There is nothing about it experimental or untried. All the devices have given years of satisfactory service in Pullman car lighting and have proven their ability to meet the requirements. Nothing has been left out that would add to its efficiency.

All in all, we present the first complete, high-grade, mechanically and electrically perfect Automobile Lighting System on the market.

*Write for new Elba catalog*

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## THE WILLARD STORAGE BATTERY COMPANY

Cleveland, Ohio

NEW YORK, 1876 Broadway

CHICAGO, 320 Dearborn St.

## ENGINES, Steam

(See Steam Automobile Motors & Marine Steam Engines.)

## ENGINE CLEANERS (Compression)

Bishop & Babcock Co., 525 Garfield Bldg., Cleveland, O. (Gasoline.)  
Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O. "Champion." (Gasoline.)  
Compression Cleaner Co., 200 Fifth Ave., N. Y. City.

## ENGINE PRIMERS

(See Priming Devices.)

## ENGINE SETS (Castings)

Hilaman, A. L. Co., Moorestown, N. J.  
Stine & Parks, Fremont, Ohio.

## ENGINE STARTERS, Auto

Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill. "Hobbs."  
American Machine Co., Eau Claire, Wis.  
★Auto Improvement Co., The, 304 Hudson St., N. Y. City. "Ever Ready."  
Gardner Engine Starter Co., 1451-55 Michigan Ave., Chicago, Ill. "Gardner."  
Globe Power Co., 1336 Cherry St., Phila., Pa.  
★Monarch Motor Mfg. Co., 3145 N. Halsted St., Chicago, Ill.  
Starter Mfg. Co., 19 N. Market St., Grand Rapids, Mich.  
Wilkinson, J. Franklin, 7 Riggs St., Gloucester, Mass. "Wilkinson."

## ENGINE STARTERS, Marine

Ferro Machinery & Foundry Co., The, 115 Wade Bldg., Cleveland, O. (Rear.)

## ENGINE VALVES

(See Valves, Engine.)

## ENGINEERS & DESIGNERS

Giddings, C. M., Rockford, Ill. (Designer of transmissions, friction drives, motors, gas producers, etc.)  
Haas, Cyrus A., M. E., Grand & Shenandoah Aves., St. Louis, Mo. (Designer on royalties & consulting engineer.)

Macfarren, Walter W., 341 6th Ave., Pittsburgh, Pa. (Designer of commercial cars & special machinery.)

Maxwell Engineering Co., 210 St. James St., Rome, N. Y. (Making blue prints & working drawings of engines, transmissions, etc.)

Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. (Designers of commercial motor vehicles & gasoline marine engines.)

Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.

Standard Gas Engineering Co., Rooms 33-34 Davis Bldg., Bradford, Pa. (Gas engine and air compressor designing.)

Stegeman, Oscar, Germania Bldg., Milwaukee, Wis.

Willard, Walter C., 7617 Quincy Ave., Cleveland, O. (Designs for gasoline auto engines.)

## EQUALIZING GEARS

(See Differential Gears.)

## EXHAUST HORNS

(See Horns, Exhaust.)

## EXHAUST MANIFOLDS

(See Manifolds & Piping.)

## EXHAUST WHISTLES

(See Horns, Exhaust.)

## EYE SHIELDS

(See Goggles.)

## FABRICS

Dusenbury, Louis & Co., Inc., 79-81 Worth St., N. Y. City. (Lining fabrics.)

★Hopewell Bros., 29 Chapel St., Newton, Mass.  
Laidlaw, Wm. R., Jr., 218 W. 49th St., N. Y. City. (Lap robe fabrics.)

Wiese, Wm. & Co., 66-68 Greene St., N. Y. City. (Imported linings.)

## FANS, RADIATOR

A-Z Co., The, 527-9 W. 56th St., N. Y. City.

"A-Z."  
Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Mich.

★ indicates Advertisers—see Index in back of book.

# ONE PIECE BLADE RADIATOR FANS

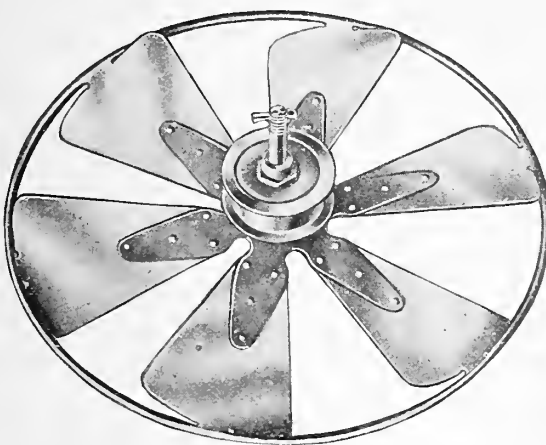
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No cast metal used in its construction;  
pulleys, hubs and spiders made from pressed  
steel; imported ball bearings, tool steel cones

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AND SKILL CAN CONSTRUCT

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THE SPARKS-WITHINGTON CO.

Jackson, Michigan

AMERICAN DISTRIBUTING CO., Selling Agents, Jackson, Mich.

**FANS, Radiator—Continued**

- Cary, Edward E. Co., 59-61 Park Pl., N. Y. City. "Sankey." (Imported.)  
 Hunt & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y.  
 Kells, W. J. Mfg. Co., 726-28 Eleventh Ave. N. Y. City.  
 Kinsey Mfg. Co., Toledo, Ohio. "Kinwood."  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McCord."  
 New Britain Sheet Metal Co., New Britain, Conn.  
 Reliable Radiator Co., Inc., 451 E. 173rd St. N. Y. City.  
 Sight Feed Oil Pump Co., Milwaukee, Wis.  
 ★Sparks-Withington Co., Ltd., The, Jackson, Mich.

**FAN BELTS**

(See Belts, Fan, Pump & Oiler.)

**FASTENERS**

- ★Brogan Automatic Fastener Co., 368 W. Fayette St., Syracuse, N. Y. (For curtains, mats, leggings & tire covers.)

**FELTS**

- Hoffeld, R. & Co., Buffalo, N. Y. (Lubricating.)  
 Reid, W. W. Mfg. Co., 131 State St., Boston, Mass. "Zip." (Metal cleaning.)  
 Tingle, Brown & Co., 64 Reade St., N. Y. City. (Lubricating & polishing.)  
 Western Felt Works, 4115-33 Ogden Ave., Chicago, Ill.

**FELT WASHERS**

(See Washers, Felt.)

**FENDERS**

(See Mud Guards.)

**FERRULES**

- Bay State Stamping Co., 380 Chandler St., Worcester, Mass. "Victor," "Monarch" & "Leader."

Hill, Geo. Q. Co., 326 A St., Boston, Mass.  
 Taunton-New Bedford Copper Co., New Bedford, Mass.

**FIBRE**

- American Vulcanized Fibre Co., 500 Equitable Bldg., Wilmington, Del. (Fibre discs, sheets, tubes, rods, washers, etc.)  
 Continental Fibre Co., Newark, Del. (Fibre sheets, rods & tubes.)  
 Delaware Hard Fibre Co., Wilmington, Del. (Hard fibre sheets, tubes, rods, cleats, etc.)  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. (Transparent.)  
 National Fibre Insulation Co., Yorklyn, Del. (Hard fibre rods, tubes, etc.)  
 Royal Fibre Co., West Somerville, Mass. (Hard fibre tubing, rods, etc.)  
 Standard Fibre Co., Somerville, Mass. (Hard fibre tubes, rods, sheets, cleats & handles.)  
 Wilmington Fibre Specialty Co., Wilmington, Del. (Fibre sheets, rods, tubes & cleats, & "Fyberoid" insulating paper.)

**FIGURES, Metal**

(See Metal Figures & Letters.)

**FILLERS**

(See Paints & Colors.)

**FILLETS, Leather**

- Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, O. "Precision."

**FINS, Radiator**

(See Radiator Parts.)

**FIRE EXTINGUISHERS**

- Allen Fire Dept. Supply Co., Eddy St., Providence, R. I. "Allen."  
 Badger Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis. ("Mitchell" dry powder, & "Copper King" liquid chemical.)  
 Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass.  
 Boyd, James & Bro., 22d St. bet. Vine & Race Sts., Phila., Pa. ("Paragon," "Keystone" & "Boyd-Motor"; "Boyd-Warehouse," two wheel chemical fire engines for garages.)

★ indicates Advertisers—see Index in back of book.

**FIRE EXTINGUISHERS—Continued**

- Buckland Fire Extinguisher Co., The, 575 Lyell Ave., Rochester, N. Y. "Buckland."
- ★Childs, O. J. Co., 48 & 50 Liberty St., Utica, N. Y. "Childs" & "Utica." (Also chemical engines.)
- Fyricide Mfg. Co., 34 Murray St., N. Y. City. "Kilfire," "Fyricide" & "King of Fire Killers."
- Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."
- Grubb, Charles Edmund, 819 Fourth Ave., Altoona, Pa. "Reliance."
- Haverhill Fire Appliance Co., 40 Merrimac St., Haverhill, Mass. "Eclipse."
- ★Johns-Manville, H. W. Co., 100 William St., New York, N. Y. ("Manville" dry powder, & "Success" liquid chemical.)
- Kilfyre, Inc., 247-49 Pearl St., N. Y. City. "Kilfyre."
- Landau, Henry W., N. J. R. R. Ave., Newark, N. J. "Fite Fire." (Dry powder.)
- Liberty Association, 12 State St., Chicago, Ill.
- Minimax Co., 198 Broadway, N. Y. City.
- Nevermyss Fire Extinguisher Co., Middletown, N. Y.
- Phoenix Fire Apparatus Co., 43 W. 34th St., N. Y. City. "Phoenix."
- Rex Fire Extinguisher Co., The, 72-76 Cortland St., New York, N. Y. "Rex." (Also portable fire engines for garages.)
- Robinson Fire Apparatus Mfg. Co., 4520 N. 20th St., St. Louis, Mo. "Gold Medal" & "Aaron."
- Rockford-Kalamazoo Fire Extinguisher Co., State & Mill Sts., Rockford, Ill.
- Royal Mfg. Co., Lancaster, Pa. "Quick-Out."
- Safety Fire Extinguisher Co., 29-33 West 42nd St., N. Y. City. "Pittsburg."
- Salmon, H. H. & Co., 82 Wall St., N. Y. City. "Little Giant."
- Snyder, M. L., 9 N. 4th St., Phila., Pa. "Pyrene" & "Acme."
- Syracuse Chemical Fire Extinguisher Co., The, Wood Bldg., Syracuse, N. Y. ("Syracuse" for garages, & "Syracuse Special" auto & boat.)
- Tea Tray Co. of Newark, The, Mulberry & Murray Sts., Newark, N. J. "Marten" & "Accurate."
- Willcox, The Chas. C. Co., 115-127 Cass St., Joliet, Ill. "Joliet."

**FLAGS & PENNANTS**

- Carpenter, Geo. B. & Co., 202-08 South Water St., Chicago, Ill.
- Chicago Flag & Decorating Co., 350-52 Wabash Ave., Chicago, Ill.
- Durkee, C. D. & Co., Inc., 2 South St., N. Y. City.
- Jacobsen, Chas. M., 52 Woodward Ave., Detroit, Mich.

**FLASH BOILERS**

(See Boilers.)

**FLEXIBLE SHAFTS**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill. (Driving shaft.)

- Automobile Supply Mfg. Co., 224 Taaffe Pl., Brooklyn, N. Y.
- Chicago Flexible Shaft Co., Chicago, Ill.
- Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass.
- Fancher Machine Co., The, Baldwinsville, N. Y.
- Webb Mfg. Co., Front & Centre Sts., Newark, N. J. "Webb."
- White, S. S. Dental Mfg. Co., 12th & Chestnut Sts., Phila., Pa.

**FLEXIBLE TUBING**

(See Tubing, Flexible.)

**FLOATS, Carburetor**

(See Carburetor Floats.)

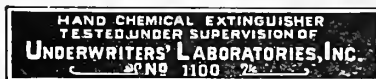
**FLOAT DRESSING**

(See Carburetor Float Dressing.)

**FLOOR MATS**

(See Mats.)

The **CHILDS** Extinguishers are approved and bear this label:



The following have equipped their factories with the "Childs":



**Stevens-Duryea Co.**  
**Olds Motor Works.**  
**Ford Motor Co.**  
**E. M. F. Co.**  
**Grabowsky Power Co.**  
**Chalmers-Detroit Motor Co.**  
**Reo Motor Co.**  
**Mora Motor Car Co.**  
**Franklin Mfg. Co.**  
**Auto Car Co.**  
**Hupp Motor Car Co.**  
**Demotcar Co.**  
**Paige Motor Car Co.**  
**Metzger Motor Car Co.**

"Utica" 40-gallon Copper Tank mounted on two wheels and with 50 ft. hose. The E-M-F Company have purchased 7 of these on one order.

**O. J. Childs Co.,** Sole Manufacturers  
**UTICA, N. Y.**



**FLUX**

(See Brazing Compounds &amp; Soldering Compounds.)

**FLY WHEELS**

- Johnston & Jennings Co., 877 Addison Rd., Cleveland, O.  
 ★Tippett Mfg. Co., The, 172-82 W. Locust St., Columbus, O.  
 Whiton, The D. E. Machine Co., New London, Conn.

**FOLDING PAIRS**

(See Collapsible Buckets &amp; Basins.)

**FOOT RESTS**

- A-Z Co., 527-29 W. 56th St., N. Y. City  
 Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.  
 Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich.  
 Auto Specialty Co., 85-87 Pearl St., Boston, Mass. (To order.)  
 B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, Ohio.  
 Baldwin & Overholt, Galesburg, Ill. "B. & O. Line."  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B. & R." (Rails.)  
 Boston Nickel Plating Co., Inc., 160 Portland St., Boston, Mass. (Rails.)  
 Burrowes, E. T. Co., Portland, Me.  
 Central Brass & Fixture Co., The, Springfield, O. (Rails.)  
 Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Amco." (Rails.)  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill. (Rails.)  
 Columbia Auto Top Co., 17 Dwight St., Springfield, Mass. (Cushions.)  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 ★Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich.  
 Downing, Chas. J., 1777 Broadway, N. Y. City. "Downing." (Rails.)  
 Fickling & Co., 304-306 W. 49th St., N. Y. City.  
 Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill. (Rails.)  
 Fowler Brass Works, Inc., The, 2333-35 Wabash Ave., Chicago, Ill. (Rails.)  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.  
 ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, Ohio. "Globe."  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. (Rails.)  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp." (Rails.)  
 Hume Carriage Co., 66-68 Stanhope St., Boston, Mass.  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Rails.)  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.

- ★Jonah & George, Merrimac, Mass.  
 Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
 Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill. (Rails.)  
 Lund Smith Co., The, 51 Godwin St., Paterson, N. J. (Rails.)  
 Metallic Specialties Co., 4228 Ludlow St., Phila., Pa.  
 M. A. N. Mfg. Co., 257 W. Exchange St., Providence, R. I. "Manco."  
 Machine Accessories & Novelties Mfg. Co., 257 West Exchange St., Providence, R. I.  
 Medina Machine & Stamping Co., Medina, N. Y. (Rails.)  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Perfection."  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., New York, N. Y. "Universal."  
 Novelty Mfg. Co., Maple St., Waterbury, Conn. "Wilwear."  
 Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson." (Rails.)  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.  
 S. M. Supplies Co., The, 22-24 Lincoln St., Boston, Mass. "Puritan."  
 ★Smith, Jos. N. Co., Fourth & Porter Sts., Detroit, Mich.  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Rex."  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City. (Rails.)  
 Turner Brass Works, The, Sycamore, Ill. (Rails.)  
 ★Vanguard Mfg. Co., Washington & Desplaines St., Joliet, Ill. "Vanguard." (Rails.)  
 ★Victor Auto Supply Mfg. Co., 42 West 43rd St., N. Y. City. "Vasco."  
 Western Brass Mfg. Works, 21st St. & Campbell Ave., Chicago, Ill.  
 Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal. "Western."  
 ★White Mfg. Co., 155 Cannon St., Bridgeport, Conn.  
 Woodruff, The Walter W. & Sons Co., Mt. Carmel, Conn.

**FOOT WARMERS**

(See Heaters.)

**FORGINGS**

- American Manganese Bronze Co., 99 John St., N. Y. City.  
 American Spiral Pipe Works, P. O. Box 485, Chicago, Ill.  
 Anderson Forge & Machine Co., 21-31 St. Aubin Ave., Detroit, Mich.  
 Atlas Drop Forge Co., Lansing, Mich.  
 Atwater Mfg. Co., Southington, Conn. (Special.)  
 Baker Drop Forge Co., Jackson, Mich.  
 Barnett Drop Forging Co., East Hampton, Mass.  
 Bates Forge Co., The, Indianapolis, Ind.  
 Belden Machine Co., The, Whaley Ave. & Tryon St., New Haven, Conn.  
 Bethlehem Steel Co., South Bethlehem, Pa. (Steel.)  
 Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. "B. & S."  
 Blakeslee Forging Co., Plantsville, Conn.

**FORGINGS—Continued**

- Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y. (Hydraulic.)
- Canton Drop Forging & Mfg. Co., Canton, O.
- Cape Ann Tool Co., Granite St., Pigeon Cove, Mass.
- Carpenter Steel Co., Rooms 1908-10, 100 Broadway, N. Y. City.
- Chicago Drop Forge & Foundry Co., Kensington Station, Chicago, Ill.
- Clapp, E. D. Mfg. Co., Auburn, N. Y.
- Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.
- Columbian Hardware Co., Cleveland, O.
- Columbia Machine Works & M. I. Co., Atlantic Ave. & Chestnut St., Brooklyn, N. Y. (Crank shaft.)
- Columbus Bolt Works, 162 W. Randolph St., Columbus, Ohio.
- Columbus Forge & Iron Co., Columbus, O.
- ★Consolidated Mfg. Co., Toledo, Ohio. (Special.)
- ★Cortland Forging Co., Cortland, N. Y.
- ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.
- ★Cramp, The, Wm. & Sons S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- ★Crescent Forgings Co., Oakmont, Pa.
- Crescent Tool Co., Jamestown, N. Y.
- Damascus Crucible Steel Casting Co., New Brighton, Pa.
- Detroit Forging Co., Detroit, Mich.
- Detroit Steel Products Co., 91-99 E. Fort St., Detroit, Mich.
- Driggs-Seabury Ordnance Corporation, Sharon, Pa.
- Drop Forging Co. of New York, West Side Ave. & Fisk St., Jersey City, N. J.
- Druen, B. D., New Haven, Conn.
- Eccles, Richard Co., Auburn, N. Y.
- Elliot, H. A., 7502 Carnegie Ave., Cleveland, Ohio.
- Emergency Forge Co., The, Lansing, Mich.
- Farist Steel Co., 137 E. Main St., Bridgeport, Conn.
- Fore River Ship Building Co., Quincy, Mass.
- Funk Engineering Co., 39-47 Fourteenth St., Hoboken, N. J.
- General Drop Forge Co., 1738 Elmwood Ave., Buffalo, N. Y.
- ★Gill, The, P. H. & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.
- Granger Drop Forge Works, West 48th Ave. & 16th St., Chicago, Ill.
- Helwig Mfg. Co. St. Paul, Minn.
- Hess-Pontiac Spring & Axle Co., Pontiac, Mich.
- Higgins Spring & Axle Co., Racine, Wis.
- Indianapolis Drop Forging Co., Indianapolis, Ind.
- International Engineering Co. of N. J., 1779 Broadway, N. Y. City. "Lemoine." (Imported.)
- Joliet Steam Forge Co., Joliet, Ill.
- Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn.
- Krcfeld Steel Co., 50 Church St., N. Y. City.
- Krupp, (Prosser & Son), P. O. Box 878, G. P. O., New York, N. Y.
- Lakeside Forge & Wrench Co., Erie, Pa.
- ★Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. "Montbard-Aulnoye." (Pistons, cylinders, axles, etc., imported.)
- ★Lewis Spring & Axle Co., Jackson, Mich.
- ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.
- ★McCue Co., Hartford, Conn.
- Machinery Forging Co., The, Hamilton & Marquette Sts., Cleveland, O.
- Marshalltown Drop Forge Co., Marshalltown, Ia.
- Martin, H. J. Forging Co., 510 Harding St., Indianapolis, Ind.
- Merrill Bros., Maspeth, N. Y.
- Michigan Bolt & Nut Works, Foot of Meldrum Ave., Detroit, Mich.
- Moore Drop Forging Co., Brightwood, Springfield, Mass.
- O. K. Tool Holder Co., Shelton, Conn. "O. K."
- Obenberger Drop Forge Co., 220-224 Lake St., Milwaukee, Wis.
- Ohio Forge Co., 2200 E. 65th St., Cleveland, O.
- Page-Storms Drop Forge Co., Chicopee, Mass.
- Park Drop Forge Co., The, 730 East 79th St., Cleveland, O.
- Philadelphia Steel & Forge Co., 50 Church St., N. Y. City.
- Phosphor-Bronze Smelting Co., The, Ltd., 2200 Washington Ave., Phila., Pa.
- Portland Foundry & Machine Co., Portland, Ind.
- Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.
- Reeves Bros. Co., Alliance, Ohio.
- Revere Drop Forge Co., Revere, Mass. (To order.)
- Richmond Forging Corporation, Richmond, Va.
- Rivetless Chain & Engineering Co., Lebanon, Pa.
- Roren Drop Forge Co., Providence, R. I.
- Scranton Forging Co., The, Scranton, Pa. (To order.)
- Seward, The M. & Son Co., Grant St., New Haven, Conn.
- Shippey, Geo. E. Co., 220 First St., Pittsfield, Mass.
- Smith, H. D. & Co., Plantville, Conn. (Special.)
- Strieby & Foote Co., 301 Ogden St., Newark, N. J.
- Sundberg, J. A. & Co., Kinzie & Carpenter Sts., Chicago, Ill.
- Tindel-Morris Co., Eddystone, Pa.
- Transue & Williams Co., The, Alliance, O.
- Union Drop Forge Co., 358 W. Indiana Ave., Chicago, Ill.
- Union Forge Co., Union, N. Y.
- Vanadium Metals Co., Frick Bldg., Pittsburg, Pa. "Victor Vanadium."

**WESTERN DROP FORGE CO.**

Manufacturers of

**Automobile Drop Forgings****Steel Tanks and Sheet Iron Work of Every Description****Highest Quality Material and Workmanship Fully Guaranteed**

Largely increased facilities enable us to insure prompt deliveries.

Send us blue prints and let us figure on your requirements.

**WESTERN DROP FORGE CO., :: MARION, IND.**

★ indicates Advertisers—see Index in back of book.

### FORGINGS—Continued

- Waterloo Drop Forge Co., Falls Ave. & Orr St., Waterloo, Ia.  
 ★Waverley Co., The, 139 S. East St., Indianapolis, Ind.  
 ★Western Drop Forge Co., The, Marion, Ind.  
 Western Tool & Forge Co., Brackenridge, Pa.  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill.  
 Williams, J. H. & Co., 150 Hamilton Ave., Brooklyn, N. Y.  
 Wyman & Gordon Co., 30 Bradley St., Worcester, Mass.

### FORKS, Cycle and Motorcycle

- ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor." (Motorcycle spring.)  
 Chicago Motorcycle Works, 732 Sheridan Rd., Chicago, Ill. (Spring.)  
 Hilaman, A. L. Co., Moorestown, N. J. "Hilaman." (Motorcycle cushion.)  
 Majestic Mfg. Co., Worcester, Mass. "Majestic." (Cycle spring.)  
 Merkel-Light Motor Co., The, Pottstown, Pa. (Motorcycle.)  
 Sager, J. Harry, 265 South Ave., Rochester, N. Y. "Sager." (Cushion.)  
 ★Standard Welding Co., The, 76th St., N. W., & L. S. & M. S. R. R., Cleveland, O.

### FORK CROWNS, Cycle & Motor Cycle

- ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.

### FRAMES, Automobile

- Driggs-Seabury Ordnance Corporation, Sharon, Pa. (Pressed steel.)  
 ★Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich. "Presteel." (Pressed steel.)  
 Heggie-Woodruff Pressed Steel Co., Joliet, Ill. (Pressed steel.)  
 ★Hydraulic Pressed Steel Co., The, Cleveland, O. (Pressed steel.)  
 Kinsey Mfg. Co., Toledo, Ohio. "Kinwood." (Pressed steel.)  
 Krupp (Prosser & Son), P. O. Box 878, G. P. O., New York City, N. Y. (Pressed steel.)  
 Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. "M.A.B." (Imported.)  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 Parish & Bingham Co., 5363 Hamilton Ave., Cleveland, O. (Cold pressed steel.)  
 Parish Mfg. Co., 7th & Chestnut Sts., Reading, Pa. (Pressed steel.)  
 ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.

### FRAMES, Boat

- Cleveland Auto Boat Mfg. Co., 1036 River Ave., Cleveland, O. (Knock down.)  
 Tallmadge, J., Baldwinsville, N. Y. (Knock down.)  
 Valley Boat & Engine Co., Baldwinsville, N. Y. "American." (Also knocked down.)  
 Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.

### FRAMES, Motor Cycle & Pedal Cycle

- Chicago Motorcycle Works, 732 Sheridan Rd., Chicago, Ill. (To order.)  
 Duck, A. W., 427 15th St., Oakland, Cal. "Duck." (Motorcycle spring.)  
 Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo. (Motorcycle.)  
 Marvel Motorcycle Co., Hammondsport, N. Y. "Marvel." (Motorcycle.)  
 Merkel-Light Motor Co., The, Pottstown, Pa. (Motorcycle.)  
 Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.  
 Sager, J. Harry, 265 South Ave., Rochester, N. Y. "Sager." (Motorcycle spring.)  
 Thiem Mfg. Co., The, Minneapolis, Minn. "Thiem." (Motorcycle.)

### FRAME FITTINGS, Cycle & Motor Cycle

- Armac Motor Co., 472 Carroll Ave., Chicago, Ill. "Armac." (Motorcycle.)  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y. (Motorcycle.)  
 ★Eclipse Machine Co., Elmira, N. Y. "Eclipse." (Head fittings.)  
 Hilaman, A. L. Co., Moorestown, N. J. (Motorcycle.)

### FRICTION CLUTCHES

(See Clutches.)

### FRICTION DISCS & FACINGS

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 Caldwell, W. H. & Son Co., Western Ave., 17th to 18th Sts., Chicago, Ill. (Paper & iron.)  
 Emerson, Smith & Co., Ltd., Beaver Falls, Pa.  
 Friction Fibre Co., 574 12th St., Milwaukee, Wis. (Friction fibre rings.)  
 Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 New York Leather Belting Co., 51 Beekman St., New York, N. Y.  
 ★Rockwood Mfg. Co., 1911 English Ave., Indianapolis, Ind. (Fibre.)

## Capacity For Pressed Steel Frames

Our splendid new plant, 1025 feet x 286 feet is now in operation with a press equipment capable of producing over 1000 sets of automobile frame parts in a single day.

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Milwaukee, Wisconsin

## **“Presteel” FRAMES**

**D**ID it ever occur to you that there are many castings on an

**AUTOMOBILE**

which might be replaced by **PRESSED STEEL**, and save material, labor and time?

**ASK US!**

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Detroit, Mich.

**FUEL**

Automobile Oil Co., 723 Baronne St., New Orleans, La. (High test gasoline.)  
 Cummer, The James W. Co., 2900 East 34th St., Cleveland, O. "Cummer's Energine."  
 Ellsworth & Armstrong Oil Co., 26 Stone St., N. Y. City. "Peerless." (Gasoline.)  
 Energine Refining & Mfg. Co., The, 809 Cuyahoga Bldg., Cleveland, O. "Energine." (Gasoline & naphtha.)  
 Indian Refining Co., Cincinnati, O. "Indian." (Oil & gasoline.)  
 New York Oil & Paint Co., 128 Maiden Lane, N. Y. City. (Gasoline.)  
 Oil City Oil and Grease Co., Oil City, Pa. "New Product" (auto gasoline).  
 Tirrill Gas Machine Lighting Co., 509 5th Ave., N. Y. City. (Gasoline & naphtha.)

**FUEL FEED REGULATORS**

★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. "Imperial."  
 Mason Regulator Co., 153 Summer St., Boston, Mass.  
 Ofeldt, F. W. & Son, Nyack, N. Y.

**FUEL LEVEL INDICATORS**

Auto Pump Co., Springville, N. Y. "S pencer."  
 Boston Auto Gauge Co., 8 Waltham St., Boston, Mass. ("Triumph" tank, & "Tanke-scope" dash gauge.)  
 Central Brass & Fixture Co., The, Springfield, Ohio. "Puritan." (Auto & motor boat.)  
 Edelmann, E. & Co., 36 La Salle St., Chicago, Ill.  
 Eisner, Harry & Co., 29 Scotia St., Boston, Mass.  
 Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Springfield." (Cup gauges & depth gauges for underground tanks.)  
 ★Hydraulic Oil Storage & Distributing Co., 606 Penobscot Bldg., Detroit, Mich. (Automatic.)  
 ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. "Triumph."  
 Kinsey Mfg. Co., Toledo, Ohio. "Kinwood."  
 National Gauge & Register Co., Minneapolis, Minn. "Hans."  
 National Motor Supply Co., Cleveland, Ohio. "National," "National-Special," "National-Pressure," "E-Z-2-C" & "Kant-Stik." (Auto & motor boat.)  
 PR Manufacturing Co., 621-659 Bellevue Ave., Detroit, Mich. "Straightline" & "PR."  
 ★Randall-Faichney Co., 251 Causeway St., Boston, Mass. "Webster."  
 Stecker Electric & Machine Co., Detroit, Mich. "Eureka."  
 Throop Perforating Co., 80 Terrace, Buffalo, N. Y.

**FUEL STRAINERS**

(See Strainers, Gasoline.)

**FUNNELS**

Atlantic Stamping Co., Rochester, N. Y.  
 Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass. (Also combination measures & funnels.)  
 Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Breeze." (Filter funnel.)  
 Hill Dryer Co., Worcester, Mass.  
 Johnson's, Iver, Sporting Goods Co., 155 Washington St., Boston, Mass. (Filter funnel.)  
 No-Shammy Co., The, 5710 Hough Ave., N. E., Cleveland, O. "No-Shammy." (Separator.)  
 Perfection Supply Co., Detroit, Mich. "Perfection."  
 Planet Co., The, Westfield, Mass. "Duplex." (Folding.)  
 Tallaferro, Whitmell T., 258 Broadway, N. Y. City. "Index."  
 Vogel, Wm. & Bros., 37 S. 9th St., Brooklyn, N. Y.  
 Wallman Mfg. Co., 283-285 5th Ave., Milwaukee, Wis. (Filter funnel.)  
 Watres Mfg. Co., 1133 Broadway, N. Y. City.  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Huriup."

**GAS BAGS**

★Diamond Rubber Co., Akron, O. "Diamond."  
 ★G & J Tire Co., Indianapolis, Ind.  
 ★Goodrich, B. F. Co., Akron, O.  
 Mattson Rubber Co., Lodi, N. J.  
 Mechanical Rubber Co., C. & P. R. R., near Nickel Plate R. R., Cleveland, Ohio. "Cleveland." (Rubber.)  
 Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y. "Alpha."  
 Seamless Rubber Co., New Haven, Conn.  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.

**GAS GENERATORS**

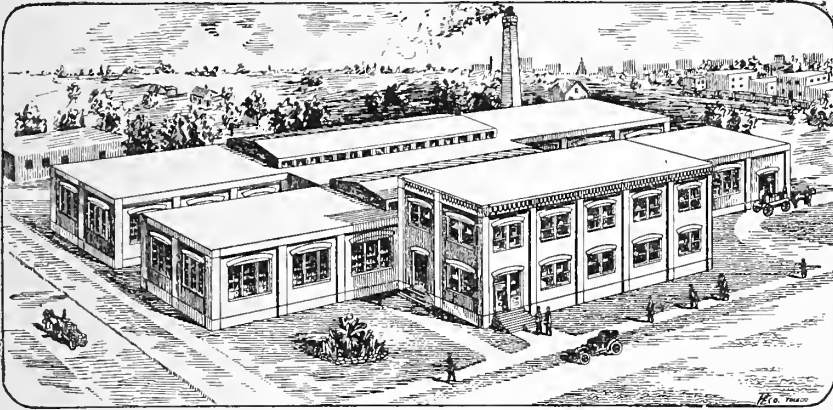
(See Acetylene Generators.)

**GASKETS**

Advance Packing & Supply Co., 55 S. Canal St., Chicago, Ill. (Motor.)  
 ★Booth, N. E., 644 Pacific St., Brooklyn, N. Y. (Paper & felt.)  
 Chicago Die & Stamping Co., Ravenswood Station, Chicago, Ill. "Fleisch" & "C. D. S."  
 Continental Rubber Works, Erie, Pa. (Rubber.)  
 Crandall Packing Co., Palmyra, N. Y. "Crandall."  
 ★Detroit Radiator Co., 324 Jefferson Ave., W. Detroit, Mich. "Detroit."  
 Fitzgerald Mfg. Co., 208 N. Elm St., Torrington, Conn.  
 Garlock Packing Co., Palmyra, N. Y. "Garlock."  
 Gasket Supply Co., The, 1729 Ludlow St., Phila., Pa. "Right." (Copper asbestos filled.)

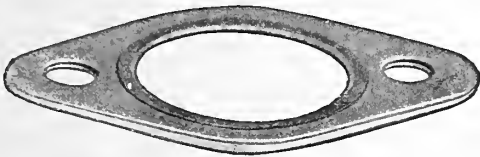
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**Monroe Electrical Manufacturing Co.**  
MONROE, MICH.



MANUFACTURERS OF

**Copper Asbestos Gaskets**  
**Battery Connectors, Spark Plugs**  
**Sheet Metal Dies and Stampings**



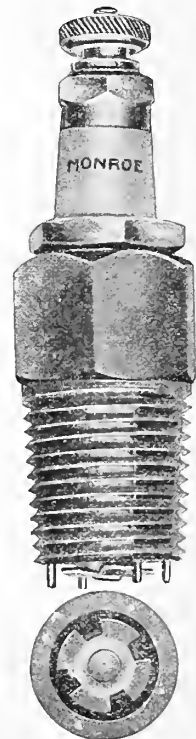
**Copper Asbestos Gaskets. All Sizes**  
SECURE OUR PRICES FOR YOUR 1911 REQUIREMENTS



**The Monroe Quick Detachable Battery Connector**



**No. 107 Battery Connector**



**The "Monroe"**  
**"There and Back"**  
**Spark Plug**

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— THE —  
**MONROE ELECTRICAL MFG. CO.**  
MONROE, MICH.

**GASKETS—Continued**

- Goodwin & Kintz, Winsted, Conn. "Gas-Tite" (copper asbestos.)  
 Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass. (Leather.)  
 Herz & Co., 203-205 Lafayette St., N. Y. City. (French asbestos copper.)  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Copper.)  
 ★Johns-Manville, W. H. Co., 100 William St., N. Y. City. (Asbestos.)  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McKim." (Copper asbestos.)  
 Massachusetts Chemical Co., Walpole, Mass. (Rubber.)  
 Monroe Electrical Mfg. Co., Monroe, Mich. (Copper asbestos.)  
 Motor Car Equipment Co., The, 55 Warren St., N. Y. City.  
 New Jersey Asbestos Co., Camden, N. J. "Gladiator." (Asbestos.)  
 Quride Co., 1417 N. Salina St., Syracuse, N. Y.  
 Rajah Auto Supply Co., Bloomfield, N. J. "Rajah."  
 Standard Fibre Co., Somerville, Mass. (Hard fibre.)  
 Taunton-New Bedford Copper Co., New Bedford, Mass.  
 ★Thermoid Rubber Co., Trenton, N. J. "Black Bare," "Tremidor," "Baffler" & "Hornet."  
 Tingle, Brown & Co., 64 Reade St., N. Y. City.  
 U. S. Indestructible Gasket Co., 50 Church St., N. Y. City. (Copper, copper-asbestos, bronze, brass, etc.)  
 U. S. Mineral Wool Co., 140 Cedar St., N. Y. City. (Corrugated copper.)

**GASOLINE AUTOMOBILE MOTORS**

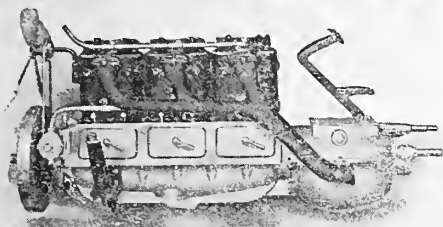
- Adams Co., The, Dubuque, Iowa. "Adams-Farwell."  
 Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 American & British Mfg. Co., Bridgeport, Conn. "A and B."  
 Anderson Engine Co., Shelbyville, Ill. "Anderson."  
 ★Anderson Motor Co., The, 16th & Jackson Sts., Anderson, Ind. "Westerfield."  
 Ansted Auto Engine Co., Connersville, Ind.  
 Atlas Engine Works, Indianapolis, Ind.  
 ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor."  
 Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich.  
 Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.  
 Bacon, Frank W., 16th & Harney Sts., Omaha, Neb. "American."  
 Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.  
 ★Beaver Mfg. Co., 783 Chase St., Milwaukee, Wis. "Beaver."  
 ★Beilfuss Motor Co., The, cor. Saginaw St. & M. C. R. R., Lansing, Mich. "Beilfuss."  
 ★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. "Brennan."  
 Brown, Chas. T., 79 Dearborn St., Chicago, Ill. "Brown."  
 ★Brownell, F. A. Motor Co., 634-66 Lexington Ave., Rochester, N. Y.  
 Buffalo Gasoline Motor Co., 1280-1290 Niagara St., Buffalo, N. Y. "Buffalo."

- Buggycar Co., The, John St. & Armory Ave., Cincinnati, Ohio.  
 Burgess, Chas. H., Wenona, Ill. "Burgess."  
 C. H. & E. Mfg. Co., Inc., 321 Mineral St., Milwaukee, Wis. (For trucks.)  
 ★Cady, C. N. Co., Inc., Canastota, N. Y. "Cady."  
 Cameron, F. F. Co., Hinsdale, N. H. "Cameron."  
 Carrico Motor Co., Station C, Cincinnati, O.  
 ★Century Electric Co., 19th & Olive Sts., St. Louis, Mo. "Century."  
 Chester Engineering & Machine Co., Front & Penn Sts., Chester, Pa. "Penn."  
 Christensen Engineering Co., The, 841-847 30th St., Milwaukee, Wis. "Christensen." (Two & four cycle.)  
 Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."  
 Clark, E. C. Motor Co., Jackson, Mich.  
 Climax Electric Works, New Salem, Mass. "Climax."  
 Columbus Screw & Machine Co., The, 244 Kaiser St., Columbus, Ohio. "Columbus."  
 Comet Motor Works, 438 W. Madison St., Chicago, Ill. "Comet."  
 Continental Engine Co., Chicago, Ill.  
 Continental Motor Mfg. Co., Muskegon, Mich. "Continental."  
 Dart Mfg. Co., 1422-28 Chase St., Anderson, Ind. "Dart."  
 ★Davis Mfg. Co., 15th St. & Park Ave., Milwaukee, Wis. "Davis."  
 Decatur Motor Car Co., Decatur, Ind. "Decatur."  
 Delphi Machine Works, Delphi, Ind.  
 Derain Motor Co., The, 7500 Quincy Ave., Cleveland, O. "Derain."  
 Deschler, August, 18-20 E. Water St., Chillicothe, Ohio.  
 De Shaw Motor Co., 50-54 Summerfield St., Evergreen, L. I., N. Y.  
 De Tamble Motors Co., Anderson, Ind. "Car rico" & "De Tamble."  
 ★Duryea, Chas. E., Reading, Pa. "Duryea."  
 Excelsior Motor & Mfg. Co., 2200-30 Union Ave., Chicago, Ill. "Excelsior."  
 Excelsior Supply Co., 233-37 Randolph St., Chicago, Ill. "Excelsior."  
 Falls Machine Co., Sheboygan Falls, Wis. "Falls."  
 Frisbie-Heft Motor Co., The, Middletown, Conn. "Frisbie-Heft."  
 Furgason Motor Co., Lansing, Mich. (Air-cooled.)  
 Garrett Machine Works Co., Garrett, Ind.  
 ★General Mfg. Co., The, Elkhart, Ind.  
 Goshen Motor Works, Goshen, Ind. "Goshen."  
 Gunderson-Walter Co., The, 182-94 Bellevue Ave., Detroit, Mich.  
 Hall Gas Engine Mfg. Co., Byesville, Ohio. "Hall."  
 Harriman Motor Works, The, South Glastonbury, Conn. "H F."  
 Harrington-Wiard Co., Lieb & Wight Sts., Detroit, Mich.  
 Hawley, R. B. Motor Works, Calhoun St., Jackson, Mich.  
 ★Hazard Engineering Co., Maple & Scherer Sts. & N. Y. C. R. R., Rochester, N. Y. "Hazard."  
 Herbert Mfg. Co., Inc., Nazareth, Pa. "Herbert."  
 Herschell-Spillman Co., N. Tonawanda, N. Y.  
 Holmes, Chas. Machine Co., Cambridgeport, Mass.  
 Ideal Mfg. Co., Portsmouth, Ohio. "Ideal."  
 Industrial Automobile Co., The, Elkhart, Ind.  
 Jencick Motor Mfg. Co., Port Chester, N. Y.  
 Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.  
 Jones, Major Motor Co., 74 Sproat St., Detroit, Mich. "Major Jones."  
 Jonz Automobile Co., Beatrice, Neb. "Jonz."  
 Kunz, J. L., Machinery Co., Milwaukee, Wis.  
 Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."

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# The "Brownell Motor"



Unit Power Plant, Automobile Model A-6

## STANDS *for* BEST THROUGHOUT

in type, design, proportions, material and workmanship. Nothing has been neglected.

Our three-point suspension Unit Power Plant, the ideal outfit for the Automobile Assembler, **has no equal**. Built in several sizes from 3½-inch bore by 4-inch stroke, up—in 4 and 6 cylinders. Heavy Motors and Transmissions for trucks up to 5 tons capacity.

A POSTAL :: A CATALOG

## F. A. Brownell Motor Company

Rochester, N. Y.

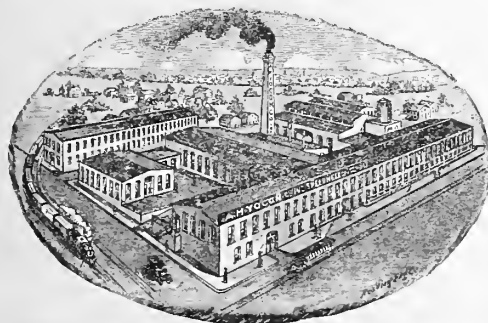
### The Perfected Speedwell 2 Cycle Air-Cooled Motor, the Motor with a Future

## ANNOUNCEMENT

In the August issue of this Journal, 1908, we had the last advertisement of any kind printed, and since this time we have been running our plant over-time, being at all times from 3 to 6 months late in delivery. Realizing that something had to be done so as to be more prompt in deliveries and also take care of the wonderful amount of new business that we were forced to turn down, we therefore decided to build a new plant, which we have done and which is now in full operation; operating our own foundries, so that we are not dependent upon any one. We will therefore be able to take care of any and all demands, on and after Jan. 1, 1910, for our line of 2 cycle air-cooled motors which are built in sizes from 6 to 50 horse-power.

The best motor proposition on the market today as hundreds of testimonials will prove. "Are you alive or a dead one?" If dead, wake up and close your contract at an early date for the "Speedwell" 2 cycle air-cooled motor and you will then have a motor that will sell your cars and increase your net earnings. 1910 catalog and price list ready.

The best motor proposition on the market today as hundreds of testimonials will prove. "Are you alive or a dead one?" If dead, wake up and close your contract at an early date for the "Speedwell" 2 cycle air-cooled motor and you will then have a motor that will sell your cars and increase your net earnings. 1910 catalog and price list ready.



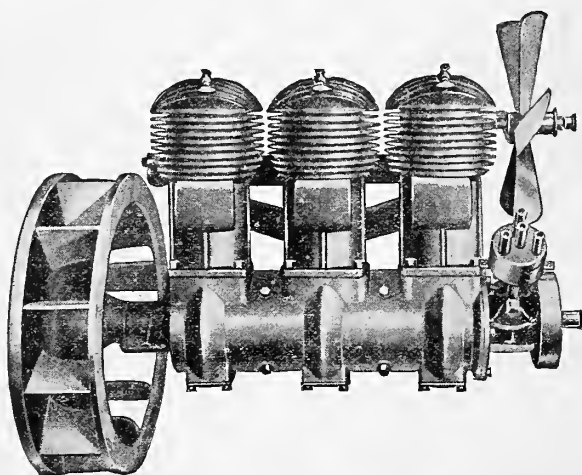
Showing the largest and best equipped plant in the world building 2 cycle air-cooled motors exclusively.

## A. H. Yocom Co.

Reading, Pa.

**GASOLINE AUTOMOBILE MOTORS—Continued**

- Lauth Auto & Engine Co., 769 Water St., Port Huron, Mich. "Wat."
- Lauth-Juergens Motor Car Co., 528 Elston Ave., Chicago, Ill.
- Lozier Motor Co., Broadway, Cor. 56th St., N. Y. City.
- Manlius Motor Co., Manlius, N. Y.
- Mark Motor Co., 8721 Harkness Rd., Cleveland, Ohio. "Mark."
- ★Michigan Automobile Co., Ltd., Kalamazoo, Mich. "Michigan."
- Miller Bros., 2331 N. Talman Ave., Chicago, Ill.
- Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis. "Majestic."
- Milwaukee Motor Co., 32nd & Burleigh Sts., Milwaukee, Wis.
- ★Model Gas Engine Works, Peru, Ind. "Model."
- Moline Pump Co., Moline, Ill.
- ★Monarch Motor Mfg. Co., 3145 N. Halsted St., Chicago, Ill. "Monarch."
- ★Monitor Automobile Works, 315 Dearborn St., Chicago, Ill. "Monitor."
- Morton Marine Motor Co., 927 Chestnut St., Camden, N. J.
- Muncie Gear Works, Muncie, Ind. "Muncie."
- Murray Machine Works, Winchester & Wabansia Ave., Chicago, Ill.
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- North American Motor Corporation, New London, Conn. "North American."
- North Chicago Machine Co., The, North Chicago, Ill.
- Northway Motor & Mfg. Co., Maybury Ave., Detroit, Mich. "Northway."
- Olin Gas Engine Co., 10-16 Lock St., Buffalo, N. Y.
- Ontario Iron Works, Pulaski, N. Y. "Ontario."
- Oswald Motor Co., Goshen, Ind.
- Pacific Iron Works, The, Bridgeport, Conn.
- Parker Motor Co., The, Hartford, Conn. "Parker."
- Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill. "Phillips."
- Pierce Motor Co., The, Racine, Wis.
- Piggins Bros., Racine, Wis.
- Port Huron Construction Co., Port Huron, Mich.
- Providence Engineering Works, 521 S. Main St., Providence, R. I.
- Puritan Machine Co., 72-74 Brush St., E., Detroit, Mich. "Puritan." (On contract.)
- Reeves Pulley Co., Columbus, Ind. "Reeves."
- Regal Gasoline Engine Co., Coldwater, Mich.
- Rice, John V., Jr., & Co., Bordentown, N. J.
- Robson Mfg. Co., Galesburg, Ill.
- Ross & Browne, 6127 Cottage Grove Ave., Chicago, Ill.
- Rowe Motor Co., Waynesboro, Pa. "Rowe."
- Russom Mfg. Co., North Aurora, Ill.
- Ryan, W. M. Co., 314 S. Canal St., Chicago, Ill. "Shortt."
- Sayre Stamping Co., Sayre, Pa.
- ★Schlosser Mfg. Co., 151 East 126th St., N. Y. City.
- Seitz, F. A. Co., 145 Frelinghuysen Ave., Newark, N. J.
- Sintz, Guy L. Co., Marshall, Mich. "Sintz." (Truck.)
- Sommer Motor Co., Illinois Ave., Aurora, Ill.
- Stenz, A. F. P., 1019 Binney St., Baltimore, Md. "Stenzy's."
- Stilson Motor Car Co., The, Pittsfield, Mass. "Stilson."



# AIR-COOLED MOTORS

For Runabouts  
and  
Delivery Wagons

## TWO CYCLE THREE PORT

We also manufacture this motor in a two cylinder for light vehicles.  
Let us send you full particulars and prices.  
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**CANASTOTA, N. Y.**

# Waukesha Motors

## In 3 Sizes, All Four Cylinder

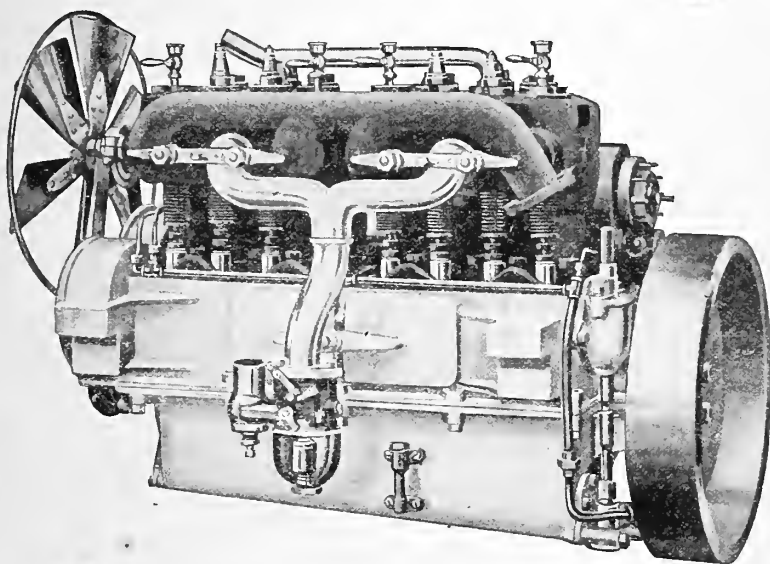
4 x 4, Type "I," 25-30 H. P.

4 $\frac{1}{4}$  x 4 $\frac{3}{4}$ , Type "A," 30-35 H. P.

4 $\frac{3}{4}$  x 5, Type "H," 40-45 H. P.

## Unit Power Plants

4 x 4, Type IU4, & 4 $\frac{1}{4}$  x 4 $\frac{3}{4}$ , Type AU4



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Dept. "C"

Waukesha, Wis.

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 Thrall Motor Co., 35 Fort St., E., Detroit, Mich.  
 ★Tippett Mfg. Co., The, 172-82 W. Locust St., Columbus, O.  
 Torbensen Motor Car Co., 610 Bloomfield Ave., Bloomfield, N. J. "Torbensen."  
 Trebert, H. L. F., 407 St. Paul St., Rochester, N. Y. "H. L. F. Trebert."  
 Trebert Gas Engine Co., Butler, Ind.  
 Truscott Boat Mfg. Co., St. Joseph, Mich.  
 Ulrich, J. M., Greenwich, Conn. "Ulrich."  
 Vim Motor Mfg. Co., The, Market & Hancock Sts., Sandusky, O. "Vim."  
 Wainwright, W. W. & Son, 16th St. & Western Ave., Connersville, Ind.  
 Warren Mfg. Co., Warren, Mass.  
 ★Waukesha Motor Co., The, Waukesha, Wis. "Waukesha." (Also complete power units.)  
 ★Western Motor Co., Logansport, Ind. "Rutenber."  
 Whitehall Motor & Boat Co., Whitehall, N. Y. "Whitehall."  
 ★Willett Engine & Carburetor Co., The, 764 Ellicott Square, Buffalo, N. Y. "Willett."  
 Williamsport Gas Engine Works, Foot of Walnut St., Williamsport, Pa.  
 Wisconsin Machinery & Mfg. Co., Canal St. & Muskego Ave., Milwaukee, Wis. "Wisconsin Valveless."  
 Wisconsin Motor Mfg. Co., Dept. 27, North Milwaukee, Wis. "Wisconsin."  
 Wood Electric & Mfg. Co., Garst St. & Vandalla Tracks, South Bend, Ind. "Wemco."  
 Xargil Mfg. Co., 36-44 Broadway, Utica, N. Y. "Xargil."  
 ★Yocom, A. H. Co., Inc., Reading, Pa. "The Speedwell." (Two cycle.)

**GASOLINE ENGINE FITTINGS,****Auto**

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 Detroit Screw Works, Detroit, Mich.  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.  
 Hampden Machine Screw Co., Springfield, Mass.  
 Haydenville Co., The, Haydenville, Mass.  
 ★Ohio Brass Co., Mansfield, Ohio. (To order.)  
 Western Automatic Machine Screw Co., Elyria, Ohio.

**GASOLINE LOCK VALVES**

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 Turner Brass Works, The, Sycamore, Ill. "Martin."  
 Williams Carburetor Mfg. Co., The, 963 Williams St., Buffalo, N. Y.

**GASOLINE MARINE MOTORS**

(See Marine Gasoline Motors.)

**GASOLINE PRIMERS**

(See Priming Devices.)

**GASOLINE & OIL PUMPS, For Garage Use**

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 ★Bowser, S. F. & Co., Inc., Fort Wayne, Ind. "Bowser." (Self-measuring.)  
 Eastern Oil Tank Co., 146 Fletcher St., Lowell, Mass. "Eastern."  
 Garage Equipment Co., 36 Manhattan St., N. Y. City. "G. E. Co." (Self-measuring.)  
 Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Springfield." (Self-measuring.)  
 Haines Oil Measuring Pump Co., Harrisburg, Pa. "Haines."  
 ★Hydraulic Oil & Distributing Co., 606 Penobscot Bldg., Detroit, Mich.  
 Iron Clad Mfg. Co., 204-6 Varet St., Brooklyn, N. Y. (Measuring.)  
 Monarch Engineering & Mfg. Co., The, 1200-1206 American Bldg., Baltimore, Md.  
 National Oil Pump & Tank Co., 411-413 E. First St., Dayton, O. (Self-measuring, power.)  
 Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."  
 Tirrill Gas Machine Lighting Co., 509 5th Ave., N. Y. City.  
 United States Pump & Tank Co., 3919 Olive St., St. Louis, Mo. (Gasoline.)  
 Wallman Mfg. Co., 283-285 5th Ave., Milwaukee, Wis. "Acme."  
 Wayne Oil Tank & Pump Co., Ft. Wayne, Ind. "Wayne." (Self measuring.)  
 Western Oil Pump & Tank Co., 2437 Kosciusko St., St. Louis, Mo. (Self measuring.)  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill.

**GASOLINE STORAGE OUTFITS**

- Ajax Auto Co., 832-34 E. 43rd St., Chicago, Ill. "Ajax."  
 American Oil Pump & Tank Co., The, Dayton, Ohio. "American."  
 Auto Trading & Repair Co., 1515 Prospect Ave., Cleveland, O. "Kart-Tank."  
 ★Bowser, S. F. & Co., Inc., Fort Wayne, Ind. "Bowser."  
 Cleveland Faucet Co., 708 Frankford Ave., N. W., Cleveland, Ohio. "Champion."  
 Dayton Iron Works Co., The, Dayton, Ohio. "Dayton."  
 Eastern Oil Tank Co., 146 Fletcher St., Lowell, Mass. "Eastern." (Self-measuring.)  
 Garage Equipment Co., 36 Manhattan St., N. Y. City. "G. E. Co."  
 Geyser Oil Tank Co., Wayne & Clinton Sts., Fort Wayne, Ind. "Geyser."  
 Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Springfield."  
 Haines Oil Measuring Pump Co., Harrisburg, Pa. "Haines."  
 ★Hydraulic Oil Storage & Distributing Co., 606 Penobscot Bldg., Detroit, Mich. "Snell." (Hydraulic.)  
 ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. (Welded seamless steel tanks.)  
 National Oil Pump & Tank Co., 411-413 East First St., Dayton, O. "Little Hercules," "National," "Eureka" & "Little Gem."

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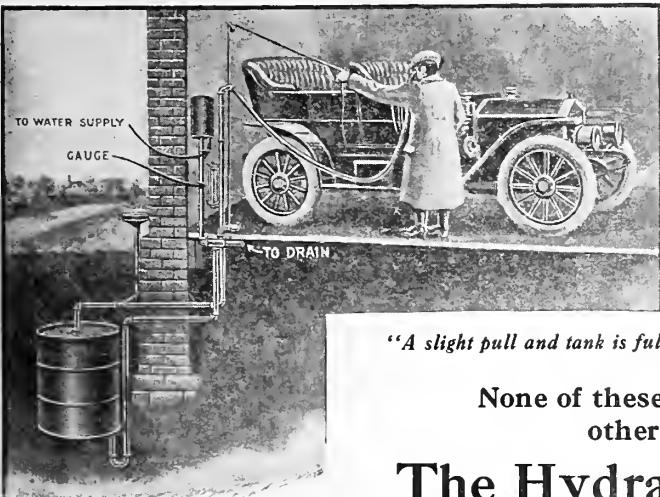
**GASOLINE STORAGE OUTFITS—Continued**

Neil, Wm. & Co., 615 Division St., Chicago, Ill.  
 "Neil."  
 Norwich Storage Tank Co., Lackawanna Ave.,  
 Norwich, N. Y.  
 Optenbug Iron Works, Sheboygan, Wis.  
 "Champion."  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y.  
 City.  
 Sexton Can Co., 2 Hartford St., Boston, Mass.  
 "Sexton."  
 Sheppard, W. S., 22 Lawrence St., Newark,  
 N. J.  
 Tirrill Gas Machine Lighting Co., 509 5th Ave.,  
 N. Y. City.  
 Tokheim Mfg. Co., The, Cedar Rapids, Iowa.  
 "Tokheim." (Self measuring.)  
 Wallman Mfg. Co., 283-285 5th Ave., Milwaukee,  
 Wis. "Acme," "Ideal," & "Wall-  
 man."

Wayne Oil Tank & Pump Co., Fort Wayne,  
 Ind. "Wayne."  
 Western Oil Pump & Tank Co., 2137 Kosci-  
 usko St., St. Louis, Mo. "Western."  
 Wilson, F. Cortez & Co., 239-241 Lake St.,  
 Chicago, Ill. "F. C. W. & Co."

**GASOLINE STORAGE TANKS**

Air-Tight Steel Tank Co., 421 Wood St., Pitts-  
 burg, Pa. "Air-Tight."  
 American Steel Barrel Co., 201-206 Varet St.,  
 Brooklyn, N. Y. (And steel shipping bar-  
 rels.)  
 American Steel Package Co., Defiance, Ohio.  
 "Defiance." (Steel barrels.)  
 American Welding Co., Carbondale, Pa.  
 Auto Trading & Repair Co., 1515 Prospect  
 Ave., Cleveland, O.  
 Beman Automatic Oil Can Co., Meadville, Pa.  
 Brown Stamping Co., Dawson St., Toledo, O.



*"A slight pull and tank is full"*

**The HYDRAULIC  
 System of Gasolene  
 Storage MEANS**

**FULL TANK  
 TOP FEED**

**NO** DIRT  
 WATER  
 DANGER  
 STRAINING  
 EVAPORATION  
 DETERIORATION

**None of these possible by any  
 other system**

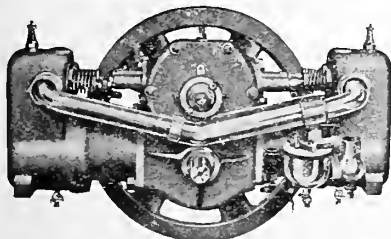
**The Hydraulic System**

has been adopted by the largest Taxicab Companies, Automobile Factories  
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**27 Broad Street, NEW YORK or 604 Penobscot Bldg., DETROIT, MICH.**

**DESIRABLE AGENTS WANTED**



**Water Cooled**

5" Bore x 4" Stroke.

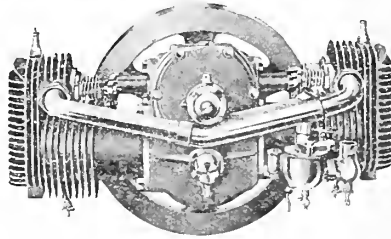
**THE TIPPETT MFG. CO.**

**TWO CYLINDER OPPOSED MOTORS**

Offset Cylinders.  
 Straight Connecting Rods,  
 Mechanically Operated Valves.

Write for complete description and prices.

**172-182 West Locust St.**



**Air Cooled**

4 1/2" Bore x 4" Stroke.  
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- Geyser Oil Tank Co., Wayne & Clinton Sts., Ft. Wayne, Ind. "Geyser."
- Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Springfield."
- Haines Oil Measuring Pump Co., Harrisburg, Pa. "Haines."
- ★Hydraulic Oil Storage & Distributing Co., 606 Penobscot Bldg., Detroit, Mich.
- Iron Clad Mfg. Co., 204-6 Varet St., Brooklyn, N. Y. (Tanks & steel barrels.)
- Kaltenbach, Fred, 919 Washington Blvd., Chicago, Ill. "Aetna."
- Koven, L. O. & Brother, 50 Cliff St., N. Y. City. "Koven."
- McNutt Non Explosion Mfg. Co., 122 Morningside Ave., E., N. Y. City.
- Pressed Steel Tank Co., West Allis Station, Milwaukee, Wis. (Barrels.)
- Ripley Steel Boat Co., Box O, Grafton, Ill. "Ripley."
- ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.
- ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.
- Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."
- Tokheim Mfg. Co., The, Cedar Rapids, Ia.
- Trageser, John, Steam Copper Works, 447 W. 26th St., N. Y. City.
- United States Pump & Tank Co., 3919 Olive St., St. Louis, Mo.
- Welded Steel Barrel Corp., Leib & Wight Sts., Detroit, Mich.
- Western Oil Pump & Tank Co., 2437 Kosciusko St., St. Louis, Mo.
- Wilton Sales Co., Wrightsville, Pa. (With latching & locking faucets.)

**GASOLINE STRAINERS**

(See Strainers, Gasoline.)

**GASOLINE TANKS, Portable**

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- ★Bowser, S. F., & Co., Inc., Fort Wayne, Ind. "Bowser."
- Eastern Oil Tank Co., 146 Fletcher St., Lowell, Mass. "Eastern."
- Garage Equipment Co., 36 Manhattan St., N. Y. City. "G. E. Co."
- Haines Oil Measuring Pump Co., Harrisburg, Pa. "Haines."
- Motor Accessories Co., 43 Cortlandt St., N. Y. City. "Wayne."
- National Oil Pump & Tank Co., 411-413 East First St., Dayton, Ohio.
- ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.
- Wayne Oil Tank & Pump Co., Ft. Wayne, Ind. "Wayne."

**GASOLINE TANK GAUGES**

(See Fuel Level Indicators.)

**GASOLINE TESTERS**

(See Hydrometers.)

**GAS TANK FOR LAMPS**

(See Acetylene Gas Tanks.)

**GAS TANK KEYS**

- Edelmann, E. & Co., 36 La Salle St., Chicago, Ill.
- Gilbert Mfg. Co., New Haven, Conn.
- Harris & Reed Mfg. Co., 1500-1518 W. 15th St., Chicago, Ill.
- Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.

**GATES, Driveway**

- Cargill Mfg. Co., W. End Buttes Ave., Columbus, Ohio. "Byerly." (Automatic.)
- Manlove Automatic Gate Co., 17 Huron St., Chicago, Ill. (Self-opening.)

**GAUGES**

(See Under "Pressure Gauges," "Fuel Level Indicators," Etc., According to Use.)

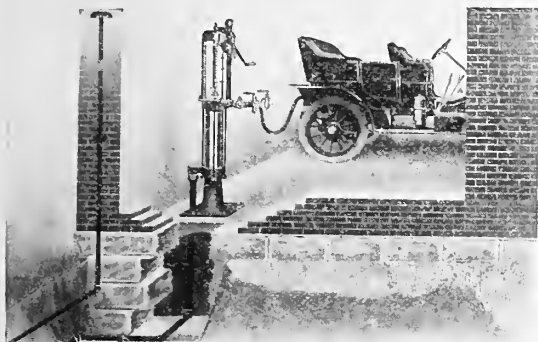
**GAUGE LAMPS**

- Alexander, The, J. Co., 1931 Broadway, N. Y. City.
- American Ever Ready Co., 303-22 Hudson St., N. Y. City. "Eveready."
- Arseno Electric Co., 819A Boyston St., Boston, Mass.
- Culver-Stearns Mfg. Co., 34 Southbridge St., Worcester, Mass. "C-S."
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Gerdelman, Benjamin Mfg. Co., 4630 Olive St., St. Louis, Mo. "Dark Light."
- Guide Motor Lamp Mfg. Co., 2069 E. Fourth St., Cleveland, O. "Guide."
- Wilkinson, A. J. & Co., 180-188 Washington St., Boston, Mass. "A. J. W. & Co."

**GAUNTLETS**

(See Gloves.)

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Put an end to  
fuel troubles  
with a  
**BOWSER**

## Underground Gasolene Tank

Why worry your car and yourself with *weak, dirty* gasolene? A Bowser Outfit will keep the *life* in your fuel—keep it as *strong* and *pure* as the day you get it.

Why let evaporation *rob* you? Not a drop is lost with a Bowser Outfit. You use *all* you buy.

Why buy a *few* gallons at a time at *retail* prices? A Bowser Outfit gives you the storage facilities for a *barrel* or more. That means *wholesale* prices.

**FREE to automobilists, prospective buyers, and owners of public and private garages: Bulletin No. 11 giving valuable pointers on gasolene storage and garage equipment. You should have it.**

Why run the risk of *fire* and *explosion*? Over a hundred Bowser Outfits went through the San Francisco fire and *not one was damaged or added fuel to the flames*.

Why bother with *dripping* measures and *leaky* cans? A Bowser Outfit pumps gasolene *directly* into your car and measures the supply *automatically*.

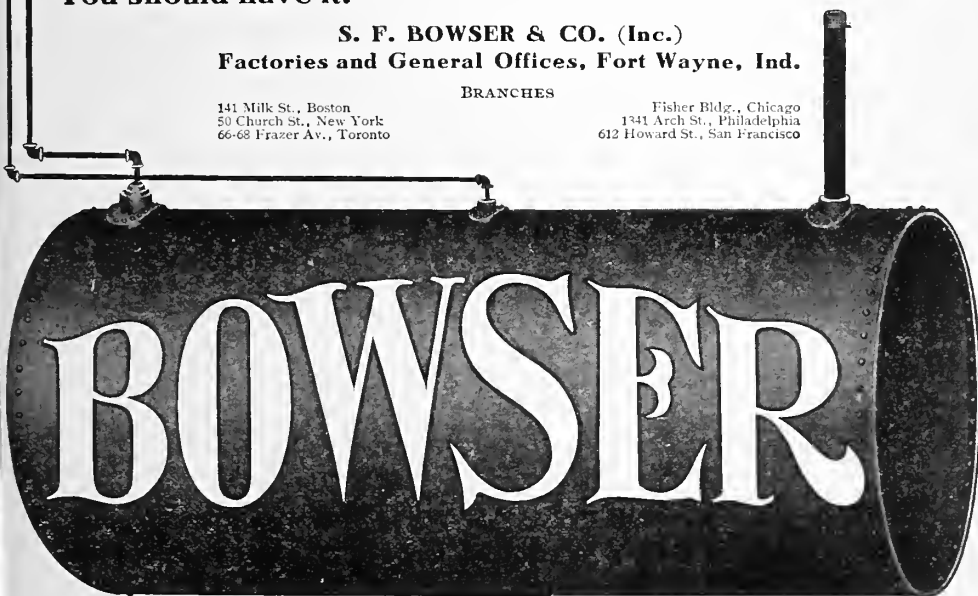
Why not store your fuel just right when you *save* money and trouble by doing it? *Bowser stored gasolene is the standard.*

**S. F. BOWSER & CO. (Inc.)**  
Factories and General Offices, Fort Wayne, Ind.

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Fisher Bldg., Chicago  
1341 Arch St., Philadelphia  
612 Howard St., San Francisco





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 American Vulcanized Fibre Co., 500 Equitable Bldg., Wilmington, Del. (Fibre gears.)  
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 Bauer Machine Co., Jeffersonville, Ind.  
 Bilgram Machine Works, 1235 Spring Garden St., Phila., Pa.  
 ★Boston Gear Works, Norfolk Downs, Mass. (Rawhide, steel & fibre.)  
 Bristol Gear & Pattern Works, 16-20 Elk St., Buffalo, N. Y.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Bultman, The F. H. Co., 2108 Superior Ave., N. W., Cleveland, O. (Metal.)  
 Caldwell, W. H. & Son Co., Western Ave., 17th to 18th Sts., Chicago, Ill.  
 Frost Gear & Machine Co., Jackson, Mich.  
 Ganschow, Wm. Co., Washington Blvd. & Morgan St., Chicago, Ill.  
 Chicago Raw Hide Mfg. Co., 348-50 Ohio St., Chicago, Ill. (Rawhide & metal.)  
 ★Cincinnati Gear Co., Race & Longworth Sts., Cincinnati, Ohio.  
 ★Cramps, The Wm. & Sons S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 Cross Gear & Engine Co., 800-806 Bellevue Ave., Detroit, Mich.  
 Delaware Hard Fibre Co., Wilmington, Del. (Hard fibre.)  
 Driggs-Seabury Ordnance Corporation, Sharon, Pa.  
 Foote Bros. Gear & Machine Co., 214-220 N. Carpenter St., Chicago, Ill.  
 Frost Gear & Machine Co., Jackson, Mich.  
 Ganschow, Wm. Co., Washington Blvd. & Morgan St., Chicago, Ill.  
 Garvin Machine Co., Spring & Varrick Sts., New York City.  
 Gear Grinding Machine Co., Detroit, Mich.  
 Gleason Works, The Brown's Race, Rochester, N. Y.  
 Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J.  
 Grant Gear Works, Boston, Mass. (Metal & rawhide.)  
 ★Grant-Lees Machine Co., 6901 Quincy Ave., Cleveland, Ohio.  
 Hartford Machine Screw Co., Hartford, Conn.  
 Holmes, Chas. Machine Co., Cambridgeport, Mass.  
 Jones, W. A. Foundry & Machine Co., North Ave. & Noble St., Chicago, Ill.  
 Lavalette & Co., Stoddard-Dayton Bldg., New York City. "M. A. B." (Gears, imported.)  
 ★Long Arm System Co., E. 38th St. & Lakeside Ave., Cleveland, O.  
 Manville Bros. Co., Waterbury, Conn.  
 Meisel Press & Mfg. Co., 944 Dorchester Ave., Boston, Mass. (Rawhide.)  
 Metal Products Co., 226 Abbott St., Detroit, Mich.  
 Michigan Auto Parts Co., 1559-1561 Jefferson Ave., W., Detroit, Mich.  
 Morse, Williams & Co., S. W. cor. 12th & Sansom Sts., Phila., Pa.  
 Muncie Gear Works, Muncie, Ind. "Muncie."  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo. (Bevel.)  
 New England Gear Works, 100 Purchase St., Boston, Mass. "N.E." (Metal & rawhide.)  
 ★New Process Raw Hide Co., The, 500 Plum St., Syracuse, N. Y. "New Process." (Raw hide pinions & metal gears.)  
 New Process Steel Co., The, 210 W. River St., Marshall, Mich. (Crucible steel.)  
 ★New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.  
 ★Niagara Machine Co., 825-27 Linwood Ave., Niagara Falls, N. Y. (To order.)  
 ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.  
 Nuttall, R. D. Co., 925 Fayette St., Pittsburg, Pa. "Nuttall."  
 Park Drop Forge Co., The, 730 E. 79th St., Cleveland, Ohio.  
 Parker White Metal & Machine Co., East 10th St., & Phila. & Erie R. R., Erie, Pa. "Parker."  
 Pennsylvania Gear Works, 435 N. Broad St., Phila., Pa.  
 Philadelphia Gear Works, 1120-22 Vine St., Phila., Pa. "Matchless." (Raw hide pinions, gears & racks.)  
 Quride Co., 1417 N. Salina St., Syracuse, N. Y. "Quride." (Metal.)  
 Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.  
 Ross Gear & Tool Co., Main & 9th Sts., LaFayette, Ind. (Bevel.)  
 Russel Wheel & Foundry Co., Detroit, Mich. (Gears.)  
 Schweppe & Wilt Mfg. Co., Meldrum & Champain Sts., Detroit, Mich. (Pinions.)  
 ★Sier-Bath Co., 143 W. 54th St., N. Y. City.  
 Smith & Wallace, Woburn, Mass. (Gears.)  
 Standard Fibre Co., Somerville, Mass. (Hard fibre gears.)  
 Standard Mfg. Co., Bridgeport, Conn.  
 ★Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.  
 T. C. M. Mfg. Co., 46 Lawrence St., Newark, N. J.  
 Throop Perforating Co., 80 Terrace, Buffalo, N. Y.  
 Turley, H. G. Machine Co., 212 Locust St., St. Louis, Mo.  
 Vanadium Metals Co., Frick Bldg., Pittsburg, Pa. (Bronze gears.)  
 Van Dorn & Dutton Co., 2714 E. 79th St., Cleveland, O.  
 Vulcan Gear Co., 820 Warren Ave., W., Detroit, Mich.  
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 Wallace Supply Co., 19 S. Jefferson St., Chicago, Ill.  
 ★Warner Gear Co., Muncie, Ind. "Warner."  
 ★Warner Mfg. Co., Toledo, Ohio.  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass.  
 ★Widmer Machine Works, Inc., 292-94 E. 135th St., N. Y. City. "Non-Swell." (Rawhide & filled.)  
 Woburn Gear Works, 32 Nashau St., Woburn, Mass. (Fibre, also pinion wire.)  
 Worcester Gear Works, 31 N. Foster Sts., Worcester, Mass.  
 Wyman & Gordon Co., 30 Bradley St., Worcester, Mass.

## GEAR BLANKS

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 American Spiral Pipe Works, P. O. Box 485, Chicago, Ill.  
 American Vulcanized Fibre Co., 500 Equitable Bldg., Wilmington, Del. (Fibre.)  
 Anderson Forge & Machine Co., 18 St. Aubin Ave., Detroit, Mich.  
 Bates Forge Co., The, Indianapolis, Ind.  
 Bethlehem Steel Co., South Bethlehem, Pa.  
 Blakeslee Forging Co., Plantsville, Conn.  
 Bultman, F. H. Co., 2108 Superior Ave., N. W., Cleveland, O.  
 Chicago Drop Forge & Foundry Co., Kensington Station, Chicago, Ill.  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel, to order.)  
 Continental Fibre Co., Newark, Del. (Fibre.)  
 Cross Gear & Engine Co., 800-806 Bellevue Ave., Detroit, Mich.  
 Delphi Machine Works, Delphi, Ind.  
 Detroit Screw Works, Detroit, Mich.  
 Driggs-Seabury Ordnance Corp., Sharon, Pa.  
 Electric Welding Products Co., The, Cleveland, O.  
 Funk Engineering Co., 39-47 Fourteenth St., Hoboken, N. J.  
 Ganschow, Wm. Co., Washington Blvd. & Morgan St., Chicago, Ill.

**GEAR BLANKS—Continued**

- General Drop Forge Co., 1738 Elmwood Ave., Buffalo, N. Y.
- ★ Gill, The P. H. & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.
- Hartford Machine Screw Co., Hartford, Conn.
- ★ Keystone Steel Castings Co., Chester, Pa.
- Krupp, (Thos. Prosser & Son), P. O. Box 878, G. P. O., N. Y. City.
- Meisel Press & Mfg. Co., 944-48 Dorchester Ave., Boston, Mass.
- Michigan Screw Co., Lansing, Mich.
- ★ New Process Raw Hide Co., The, 500 Plum St., Syracuse, N. Y.
- New Process Steel Co., The, 210 W. River St., Marshall, Mich. (Crucible steel.)
- Obenberger Drop Forge Co., 220-24 Lake St., Milwaukee, Wis. (And weldless rings.)
- Royal Fibre Co., West Somerville, Mass. (Hard fibre.)
- Schwepe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich.
- ★ Sier-Bath Co., 143 W. 54th St., N. Y. City.
- ★ Standard Welding Co., The, 76th St., N. W., & L. S. & M. S. R. R., Cleveland, Ohio. (Rings.)
- Wilmington Fibre Specialty Co., Wilmington, Del. (Fibre.)

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- Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel, to order.)
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- Cross Gear & Engine Co., 300-306 Bellevue Ave., Detroit, Mich.
- T. C. M. Mfg. Co., The, 46 Lawrence St. Newark, N. J.
- ★ Tippet Mfg. Co., The, 172-82 W. Locust St. Columbus, O.

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- Adams Co., The, Dubuque, Ia.
- Bilgram Machine Works, 1235 Spring Garden St., Phila., Pa.
- ★ Boston Gear Works, Norfolk Downs, Mass.
- Chicago Raw Hide Mfg. Co., 348-50 Ohio St. Chicago, Ill.
- ★ Cincinnati Gear Co., Race & Longworth Sts. Cincinnati, O.
- Dorman, John H., 1 Bethune St., N. Y. City
- Fay & Scott, Dexter, Me.
- Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J.
- ★ Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.
- ★ Long Arm System Co., E. 38th St. & Lakeside Ave., Cleveland, O.
- Manville Bros. Co., Waterbury, Conn. (Cam cutting.)
- Mutual Machine Co., 25 Wells St., Hartford, Conn.
- National Engineering Co., Saginaw, Mich.
- ★ New Process Raw Hide Co., The, 500 Plum St., Syracuse, N. Y.
- Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.
- ★ Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.
- ★ Sier-Bath Co., 143 W. 54th St., N. Y. City.
- Smith & Wallace, Woburn, Mass.
- ★ Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind. (Also sprocket cutting.)
- T. C. M. Mfg. Co., The, 46 Lawrence St., Newark, N. J.
- Turley, H. G. Machine Co., 312 Locust St., St. Louis, Mo.
- Universal Machinery Co., 1916 St. Paul Ave., Milwaukee, Wis.

**GEAR CUTTING COMPOUND**

Bailey Oil Co., Toledo, Ohio. "Bailey."

We are equipped for making all kinds of **Automobile Parts**,—our facilities are unsurpassed for making

**Metal Gears, Raw Hide and Fibre  
Gears, Gear Cutting, Sprockets, Gear  
Blanks and Screw Machine Parts**

Our up-to-date equipment enables us to quote attractive prices, make prompt deliveries and guarantee the quality and accuracy of our work.

**SIER-BATH CO.**

143 W. 54th St.

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New York City

**GEARS BEVEL, SPUR and MITER**

Cut on Bilgram and Brown & Sharpe Machines

**THE CINCINNATI GEAR CO.**  
120 Opera Place - CINCINNATI, OHIO

We Furnish Gears Complete or do the Cutting on Blanks Furnished

★ indicates Advertisers—see Index in back of book.

**GEAR SHIFT LEVERS**

(See Levers, Speed Change.)

**GENERATORS, Acetylene**

(See Acetylene Generators.)

**GENERATOR TUBING**

(See Tubing, Rubber.)

**GENERATOR VALVES**

(See Mixing Valves, Generator Valves &amp; Vaporizers.)

**GLASS**

Art Glass Co., 80-82 Jefferson Ave., Detroit, Mich. (Beveled & plain plate glass, glass for sight feeds, gauge glasses & oil cups.)

**GLASS FRONTS**

(See Wind Shields.)

**GLASS FRONT CLEANERS**

B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, Ohio. "Bacher."

**GLOVES**

Allen, J. C. & Sons, Gloversville, N. Y. "Allen."  
 American Glove Co., 18 Churchill St., Chicago, Ill. "Turtleneck."  
 American Tire Co., Owosso, Mich. "Salisbury."  
 Chicago Auto Robe Supply Co., 157 Market St., Chicago, Ill. (Fur.)  
 Detroit Leather Specialty Co., Inc., Michigan & Beecher Aves., Detroit, Mich. "Boulevard."  
 Eisendrath Glove Co., Armitage & Elston Ave., Chicago, Ill.  
 Ellsworth & Thayer Mfg. Co., Milwaukee, Wis. "Kantryp."  
 Fremont Mitten & Glove Co., 60 Wood St., Fremont, Ohio.

Fried-Osterman Co., Rockford, Ill. "Price."  
 Gloversville Auto Glove Co., Gloversville, N. Y. "M.W.M."

Hansen, O. C. Mfg. Co., 352 E. Water St., Milwaukee, Wis. "Hansen."

Heagle, James, First Ave. & Market St., Johnstown, N. Y. "Black Ghost."

M. & E. Mfg. Co., Ashland, Ohio. (Oilskin, repair.)

MacDonald & Campbell, 1334-36 Chestnut St., Phila., Pa.

Morawetz Co., The, 217-225 E. Water St., Milwaukee, Wis.

★Morrison-Ricker Mfg. Co., Grinnell, Iowa. "Grinnell Rist-fit" & "Grinnell Ventilated."

Pontiac Knitting Co., Pontiac, Mich.

Price, H. W. Co., Rockford, Ill. "Price."

Revillon Freres, 19 W. 34th St., N. Y. City.

Rex Shield & Mfg. Co., Connersville, Ind. "Rex."

Scandinavian Fur & Leather Co., 16 W. 33rd St., N. Y. City.

Seamless Rubber Co., New Haven, Conn. "Nearkid."

Shuman, A. & Co., Washington & Summer Sts., Boston, Mass.

Southern California Glove Co., 204 E. 9th St., Los Angeles, Cal.

Spear-Martin Fur Co., 41 Church St., Burlington, Vt. "Spear's Adirondack."

★Wallace, Hugh Co., 1680 Orleans St., Detroit, Mich.

**GLUE**

Binney & Smith Co., 81-83 Fulton St., N. Y. City. (Marine.)

Delany & Co., 209 N. 3rd St., Phila., Pa.

Ferdinand, L. W. & Co., 201 South St., Boston, Mass. ("Jeffery's" marine, & "20th Century" linoleum glue-cement.)

**GOGGLES**

★American Thermo-Ware Co., 16 Warren St., N. Y. City. "La Parfaite" & "Autocrat." (Imported.)

Automobile Apparel Co., 14 W. 22nd St., N. Y. City. (Fur.)

Chicago Eye Shield Co., 128-134 S. Clinton St., Chicago, Ill. "Chicago."

Consolidated Optical Mfg. Co., 115 W. 129th St., N. Y. City.

Cover, H. S., South Bend, Ind. "Cover." (Rubber.)

Friedlander, Jos. & Bro., 8 Maiden Lane, N. Y. City.

Globe Optical Co., 403 Washington St., Boston, Mass. "Globe."

Iowa Optical Co., New London, Iowa. "Cook's."

King, Julius Optical Co., 10-12 Maiden Lane, N. Y. City.

Lloyd, A. J. & Co., 323 Washington St., Boston, Mass. (Imported.)

Meyerowitz, E. B., 104 East 23rd St., N. Y. City.

Motor Car Equipment Co., The, 55 Warren St., N. Y. City.

Ophthalmoscope Co., Toledo, O. "Non-Strain."

Pneumatic Mfg. Co., The, 2 & 3 South St., N. Y. City.

Reynolds, Harry H., 1205 Monadnock Block, Chicago, Ill. "Reynolds."

Scandinavian Fur & Leather Co., 16 W. 33rd St., N. Y. City.

Scheidig, John & Co., 50 Maiden Lane, N. Y. City.

★ Indicates Advertisers—see Index in back of book.

**GOGGLES—Continued**

- Spencer Optical Mfg. Co., 31 Malden Lane, N. Y. City. "Audemair" & "Perfection."  
 Sussfeld, Lorsch & Co., 27-39 Malden Lane, N. Y. City.  
 Texas Co., 212-14 Kinzie St., W., Chicago, Ill. "Boston" & "Rex 4 Way."

**GONGS**

- ★National Tube Co., Frick Bldg., Pittsburg, Pa. "Shelby."

**GRADEMETERS**

- Adams Co., The, Dubuque, Ia. "Gradometer."  
 ★American Thermo-Ware Co., 16 Warren St., N. Y. City. (Imported.)  
 Buckley, Samuel & Co., 225 Fifth Ave., N. Y. City. "Kipling's Gradometer."

**GRAPHITE**

- Acheson Oildag Co., Niagara Falls, N. Y. ("Oildag Paste" graphite and oil, and "Aquadag Paste" graphite and water.)  
 American Oil Co., 170-78 S. Water St., Jackson, Mich. "Amoco."  
 Carpenter, Walter D. Co., 39 Cortlandt St., N. Y. City. "Graphlio" & "Chester Flake."  
 ★Dixon, Jos. Crucible Co., Jersey City, N. J. "Graphitoleo" & "Dixon's" (motor graphite.)  
 ★Haws, George A., 73 Pine St., N. Y. City. "Panhard."  
 Hill & Griffith Co., The, 1248-1262 State Ave., Cincinnati, O.  
 International Acheson Graphite Co., Niagara Falls, N. Y.  
 Obermayer, The S. Co., Cincinnati, O.  
 Robinson, Wm. C. & Son Co., 336-342 North St., Baltimore, Md. (Graphite grease.)  
 U. S. Graphite Co., Saginaw, Mich. "U. S. G. Co.'s."  
 Western Chemical Mfg. Co., 208 Fourth St., Milwaukee, Wis.  
 Winn, W. R., 143 Maiden Lane, N. Y. City. "Winn's."  
 Wisconsin Graphite Co., Steven's Point, Wis.  
 Woods & Peck Co., Wurtsboro, N. Y. "Auto-Graph."

**GREASES**

- A. & N. Oil Co., 1931 Broadway, N. Y. City. "Peerless."  
 Adams Grease & Oil Co., 159 West 51st St., N. Y. City. "Adams." (Also gear compound.)  
 Alexander, H. T. & Co., 17 State St., New York, N. Y.  
 American Oil Co., 170-78 S. Water St., Jackson, Mich. "Amoco."

- American Oil & Disinfectant Co., 96 Beekman St., N. Y. City. "Sparrow."  
 Atlantic Refining Co., Citizen's Bldg., Cleveland, Ohio. "Arco."  
 Auto Oil Co., 172 S. Water St., Jackson, Mich. "Red Cross."  
 Bailey Oil Co., Toledo, O. "Bailey."  
 Baker, Wm. T., 228-32 Suydam Ave., Jersey City, N. J. "Safeguard."  
 ★Baum's Castorine Co., Rome, N. Y. "Baum's."  
 ★Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill. "Helmet."  
 Borne, Scrymser Co., 80 South St., N. Y. City. "Silex," "Colo" & "Colonial."  
 Boston Grease Co., Boston, Mass.  
 Carpenter, Walter D. Co., 39 Cortlandt St., N. Y. City. "Graphlio."  
 Cataract Refining & Mfg. Co., Buffalo, N. Y.  
 Cedaroleum Company, Perkinsville, Vt. "Cedaroleum."  
 Cincinnati Oil Works Co., The, Cincinnati, Ohio. "Nonfrixo."  
 Clarkson & Ford Co., 55 Water St., N. Y. City. "Banner."  
 Cleveland Auto-Clutch Dressing Co., Cleveland, Ohio. "Dustless Chain Dressing" & "Auto Gear Compound."  
 Colgan Mfg. & Supply Co., 42 South St., N. Y. City. "Colgan."  
 ★Columbia Lubricants Co. of New York, 116 Broad St., N. Y. City. "Monogram."  
 Como Electrical Co., Spring Lake, N. J. "Hiko." (Commutator compound.)  
 ★Cook, Adam's Sons, 313 West St., N. Y. City. "Albany."  
 Cortland Specialty Co., 176 Railroad St., Cortland, N. Y.  
 Crane, L. M. & Co., 91 Oliver St., Boston, Mass. "Eureka." (Also transmission compounds.)  
 Crescent Oil & Grease Co., Cleveland, Ohio. "Franklin."  
 Crew-Levick Co., 2231 Land Title Bldg., Phila., Pa. "Perfection."  
 Curry Oil & Supply Co., Boston, Mass. "Cosco."  
 ★Davey & Co., 2600-08 Grand Ave., Chicago, Ill. "Century."  
 ★Dixon, Joseph Crucible Co., Jersey City, N. J. ("Dixon's" cup grease, "Dixon's Nos. 675, 677 & 688" transmission lubricants, "Dixon's No. 676" & "Dixon's Motor Chain Compound.")  
 Duffy Grease Co., 520 W. 40th St., N. Y. City. "Duffy."  
 Eagle Lubricating Oil Co., 426-28 First Ave., Pittsburg, Pa.  
 Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. "Eagleline."  
 Ellsworth & Armstrong Oil Co., 26 Stone St., N. Y. City. "Peerless."  
 Engerine Refining & Mfg. Co., The, 809 Cuyahoga Bldg., Cleveland, Ohio.  
 Ensign Refining Co., 10605 Quebec Ave., Cleveland, Ohio.  
 Fiske Bros. Refining Co., 24 State St., N. Y. City. ("Climax-Synovia"; "Phoenixo" gear case lubricant.)  
 Floyd, Frank Harris, 143 Beaubien St., Detroit, Mich.  
 Franklin Oil Works, Franklin, Pa.  
 Frank Oil Co., The, Titusville, Pa. (Transmission.)  
 Gallaway, G. W., 322 Pearl St., N. Y. City.  
 Geoghan, A. & Son, Inc., 207 Newell St., Brooklyn, N. Y. "Great Arrow."  
 Harris, A. W. Oil Co., 326-328 S. Water St., Providence, R. I. "Harris." (Motor & graphite grease.)  
 ★Havoline Oil Co., The, 80 Broad St., N. Y. City. "Packard."  
 ★Haws, George A., 73 Pine St., N. Y. City. "Panhard."  
 ★Hollingshead, The, R. M. Co., Camden, N. J. "Whiz." (Cup.)  
 Houghton, E. F. & Co., 240 W. Somerset St., Phila., Pa. "Motoline."  
 Ilsley-Doubleday & Co., 229-231 Front St., N. Y. City. "Ilsley's Graphite Auto-Grease."

**GREASES—Continued**

Indian Refining Co., Cincinnati, O. "Indian."  
 International Acheson Graphite Co., Niagara Falls, N. Y. (Graphited.)  
 Kellogg, E. H. & Co., 243 & 244 South St., N. Y. City. "Anti-Friction" & "Excelsior."  
 Kellom, Chas. F. & Co., 113 Arch St., Phila., Pa. "Invader."  
 Kenney, F. Mfg. Co., 360-368 Dorchester Ave., Boston, Mass.  
 ★Keystone Lubricating Co., 20th St. & Allegheny Ave., Phila., Pa. "Keystone."  
 Keystone Oil & Supply Co., Inc., Pittsburg, Pa. "Premium" & "Universal."  
 Knapp-Greenwood Co., 1000 Boylston St., Boston, Mass. "Boston." (Spring.)  
 Loos & Dilworth, 134 S. Front St., Phila., Pa. "Paragon."  
 Lynch, Alonzo K., Inc., 310-12 Flushing Ave., Brooklyn, N. Y. "Advance."  
 McLean-Brandom Oil & Supply Co., 65 Long Wharf, Boston, Mass. "M. & B."  
 Manhattan Oil Co., 51 Front St., N. Y. City. "Palm-U-Neek" & "Hi-Lo."  
 Marshall Oil Co., Marshalltown, Ia. "Rex." (Cup.)  
 Miller & McLean, 120 Liberty St., N. Y. City. "M. & M."  
 Miller, Wm. P. Sons, Nott Ave. & Hancock St., L. I. City, N. Y. "Miller's" & "Excelsior." (Bicycle chain lubricant.)  
 Modoc, Co., The, Fernwood, Pa. "Modoc."  
 Monarch Mfg. Co., Council Bluffs, Ia. "Gold Metal." (Cup.)  
 Mound City Oil & Supply Co., 202 N. Commercial St., St. Louis, Mo.  
 National Oil & Supply Co., First & Essex Sts., Harrison, N. J. "Viscos" (also graphite grease.)  
 New York Mica & Mfg. Co., 122 Clark St., Auburn, N. Y. "Micaline." (Gear & cup.)  
 New York & New Jersey Lubricant Co., 165 Broadway, N. Y. City. "Auto-Greas."  
 New York Oil & Paint Co., 123 Maiden Lane, N. Y. City. "Bully." (Gear compound & cup grease.)  
 Nye, William F., New Bedford, Mass.  
 Oakes, Fred T., 150 Nassau St., N. Y. City. "Oakes."  
 Panama Oil & Grease Co., 159 West 51st St., N. Y. City.  
 Paragon Refining Co., The, Front St., Toledo, Ohio.  
 Penberthy Injector Co., 360 Holden Ave., Detroit, Mich.  
 Penn Petroleum Co., 117 N. 2nd St., Phila., Pa. "Primus."  
 Pennsylvania Lubricating Co., 34th St. & A. V. Ry., Pittsburg, Pa.  
 Pennsylvania Oil Works Co., 1771 Broadway, N. Y. City. "Fiat" & "Zenith."  
 Petroleum Products Co., 3600 Grand Blvd., Pittsburg, Pa.  
 Philadelphia Grease Mfg. Co., 848-50 S. Swanson St., Phila., Pa. "Philadelphia."  
 Pigot, Sayre Co., The, 135 William St., N. Y. City. "Aurora."  
 Pittsburg Gauge & Supply Co., 30th & Liberty Sts., Pittsburg, Pa. "Bestovall."  
 Reliance Oil & Grease Co., Cleveland, Ohio. "Reliance."  
 Robinson, Wm. C. & Son Co., 336-342 North St., Baltimore, Md. "Greoil" & "B. Journal Compound."  
 Royal Lubricating Oil Co., 116 Broad St., N. Y. City. "Min-Carb."  
 Schilling, Frederick, 365 Pearl St., N. Y. City.  
 Sheppard, W., 141 E. 25th St., N. Y. City. "Yama."  
 Sheppard, W. S., 22 Lawrence St., Newark, N. J. "Ideal"; (also "Fibroviscos" gear lubricant.)  
 Skat Mfg. Co., Hartford, Conn.  
 Sonneborn, L. Sons, 262 Pearl St., N. Y. City. "Amalie."  
 Speare, The Alden's Sons Co., 369 Atlantic Ave., Boston, Mass.  
 Standard Oil Co., Inc., Room 609, 26 Broadway, N. Y. City. "Polarine." (Cup grease

& transmission lubricant.)

Star Oil Co., 700-08 S. Desplaines St., Chicago, Ill.  
 Sullivan Oil Co., 413 Wells St., Chicago, Ill. "Sullivan."  
 Swan & Finch Co., 151 Maiden Lane, New York, N. Y. "Atlas."  
 Sweet, Charles F., Inc., 20 Ford St., Hartford, Conn. "Climax" & "Sweet's."  
 Tingley, Chas. O. & Co., Rahway, N. J. "C. O. T." (Cycle chain lubricant.)  
 Tiona Refining Co., Indianapolis, Ind. "Palmetto."  
 Tropical Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O.  
 Tygert, E. A. Co., 126 N. Front St., Phila., Pa. "Motorlube."  
 U. S. Graphite Co., Saginaw, Mich. "U. S. G. Co.'s."  
 ★Vacuum Oil Co., Rochester, N. Y. "Mobilubricant." (Cup; also transmission grease.)  
 Valvoline Oil Co., 11 Broadway, N. Y. City. "Valvoline."  
 Warren Lubricant Co., Buffalo, N. Y. "Spermo." "Perfecto" & "Universal."  
 ★White & Bagley Co., The, Worcester, Mass. "Oilzum." (Also graphite grease.)  
 Winn, W. R., 143 Maiden Lane, N. Y. City. "Runeasy."  
 Wisconsin Graphite Co., Steven's Point, Wis.  
 Young, Orlando, W., 174-180 Frelinghuysen Ave., Newark, N. J. "Young's."  
 Zurn, O. F. Co., Broad & Lehigh Ave., Phila., Pa. "Peerless."

**GREASE BAGS**

Allen Auto Specialty Co., 1926 Broadway, N. Y. City. "Allen."  
 Bohnet, John & Co., 114-116 Grand Ave., South, Lansing, Mich.  
 Detroit Leather Works, 844 Woodward Ave., Detroit, Mich.  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert." (Steering knuckle boots.)  
 Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City.  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."  
 Perkins-Campbell Co., The, 622 Broadway, Cincinnati, Ohio.  
 Rex Shield & Mfg. Co., Connersville, Ind. "Rex."  
 Sutherland, The F. L. Co., Detroit, Mich.  
 ★Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, Ohio. "Gordon."

**GREASE CUPS**

American Injector Co., Detroit, Mich.  
 American Lubricator Co., Detroit, Mich.  
 Bay State Stamping Co., 380 Chandler St., Worcester, Mass.  
 ★Besly, Chas. H. & Co., 115-21 S. Clinton St., Chicago, Ill.  
 ★Bowen Mfg. Co., Mechanic St., Auburn, N. Y. "Empress."  
 ★Cook's, Adam Sons, 313 West St., N. Y. City. "Albany."  
 Crane Co., 1214 S. Canal St., Chicago, Ill.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Detroit Lubricator Co., Detroit, Mich. "Detroit."

**GREASE CUPS—Continued**

- Erie Stamping & Mfg. Co., Erie, Pa. "Erie."  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich. "Essex."  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Hall Mfg. Co., John & Gold Sts., N. Y. City.  
 Haydenville Co., The, Haydenville, Mass.  
 Kelly & Jones Co., Greenburg, Pa.  
 ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.  
 Lindholm Metal Stamping Co., 107 Erie St., Camden, N. J. "Lindholm."  
 Lonergan, J. E. Co., 211-13 Race St., Phila., Pa.  
 ★Lunkenheimer Co., The, Cincinnati, Ohio. "Owl," "Mite," "Ideal," "Tiger," "Gem," "Apollo," "Lock," "Positive," "Surety," "Rex," "Marine," "Jewel" and "Lion."  
 ★Mechanical & Electrical Mfg. Co., rear 2227 Prairie Ave., Chicago, Ill. "Memco."  
 Michigan Lubricator Co., 661-71 Beaubien St., Detroit, Mich.  
 No-Shammy Co., The, 5710 Hough Ave., N. E., Cleveland, O. "No-Shammy." (Self-locking, not expanding.)  
 Philadelphia Lubricator & Mfg. Co., The, Bourse, Phila., Pa. "Philadelphia."  
 Powell, Wm. Co., 2521-2531 Spring Grove Ave., Cincinnati, O.  
 Sherman, H. B. Mfg. Co., 12 Barney St., Battle Creek, Mich. "Premium" & "Active."  
 ★Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y. "Niagara," "Sherwood" & "Buffalo."  
 Tell City Foundry & Machine Works, Tell City, Ind. "Omega" & "Auto."  
 Tucker, W. L. & C. F., 302 Asylum St., Hartford, Conn. "Tucker's." (Positive lock.)  
 Winkley Co., The, 226 Abbott St., Detroit, Mich. "Thiem."

- Elkhart Brass Mfg. Co., 908 Prospect St., Elkhart, Ind.  
 Erd Motor Co., Saginaw, Mich.  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich. "Essex."  
 Fowler Brass Works, Inc., The, 2333-35 Wash Ave., Chicago, Ill. "Fowler."  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Gleason, Peters Air Pump Co., 255-261 Clarkson Ave., Brooklyn, N. Y. "G. P."  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. "Hancock."  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp." (Grease.)  
 Hastings & Anderson, 45 & 47 Lake St., Chicago, Ill.  
 Hauck-Seebach Co., 291-95 Essex St., Brooklyn, N. Y.  
 Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Hine-Watt." (Oil guns.)  
 ★Hunt Mfg. Co., The, East Second St., Ottumwa, Ia. "Hunt." (Grease.)  
 Knapp Mfg. Co., N. Y. City.  
 ★Miller & Starr, 250 Greene St., Brooklyn, N. Y.  
 Motor Car Equipment Co., 55 Warren St., New York, N. Y. (Imported.)  
 ★Motor Car Supply Co., 1451-55 Michigan Ave., Chicago, Ill. "Oilejammer" & "Grease-jammer."  
 New York Coach & Auto Lamp Co., 794-798 Tenth Ave., N. Y. City. "Universal."  
 New York & New Jersey Lubricant Co., 165 Broadway, N. Y. City. "N.F.O."  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 ★Randall-Faichney Co., 251 Causeway St., Boston, Mass. "B-Line."  
 Rubly Mfg. Co., Tuckahoe, N. Y. "Tuckahoe."  
 Standard Sheet Metal Co., Delaware Ave., Passaic, N. J. "Pioneer." (Grease.)  
 Tell City Foundry & Machine Works, Tell City, Ind. "Goul." (Grease.)

**GREASE & OIL GUNS**

- Agner, Raymond C. & Co., Burlington, Wis. "Burlington Simplex."  
 American Lubricator Co., Detroit, Mich.  
 Auto Pump Co., Springville, N. Y. "Spencer."  
 Balzer, Gus, 1777-79 Broadway, N. Y. City. (Grease.)  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B & R Ring Piston."  
 Brown Co., The, 1071-73 S. Clinton St., Syracuse, N. Y. "Brown."  
 Climax Specialty Co., Seneca Falls, N. Y. "Climax."  
 Cormack, M. H. & Co., Motor Mart Bldg., N. Y. City. "Cormack." (Combination.)  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (Grease.)  
 ★Delta Mfg. Co., The, Bloomfield, N. J.  
 Downing, Chas. J., 1777 Broadway, N. Y. City. "Downing."

**GREASE STORAGE TANKS**

- ★Hunt Mfg. Co., The, East Second St., Ottumwa, Ia. "Hunt."

**GRIPS, Handle Bar; Cycle & Motor Cycle**

- American Enamel Co., Providence, R. I. "Mascot."

**MILLER'S STANDARD QUICK OPERATING GUNS**

Strong  
Quick



Reliable  
No Waste

Note the Double Spiral Worm

Capacity, 8 ounces. Filled and emptied of heavy grease in thirty seconds.  
 Emptied with 8 turns of the wrist. Most powerful gun yet produced. Quickest operating.

GREASE GUN, \$2.00

Fully Guaranteed

COMBINATION GUN, \$2.50

**MILLER & STARR, 1781 BROADWAY, NEW YORK**

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**GRIPS, Handle Bar; Cycle & Motor Cycle—Continued**

- ★G & J Tire Co., Indianapolis, Ind. "G & J."  
 ★Goodrich, B. F. Co., Akron, O. (Soft rubber.)  
 Hartford Rubber Works Co., 691 Park St.,  
 Hartford, Conn. "Rough Rider." (Extension.)  
 Mattson Rubber Co., Lodi, N. J. "Mattson."  
 (Sponge rubber.)  
 Mueller, L. J., 6417 Woodland Ave., S. E.,  
 Cleveland, O. "Mueller." (Rubber.)  
 Peterlein, C. E., Grand Rapids, Mich.  
 (Leather & corrugated rubber.)  
 Standard Leather Washer Mfg. Co., 24-26  
 Boudinot St., Newark, N. J. "Gray's Ever-  
 wear" & "Gray's E-Z-Ride."  
 Stokes, Jos. Rubber Co., Trenton, N. J.  
 (Hard rubber.)  
 Wolverine Leather Goods Co., 51-59 Fort St.,  
 E., Detroit, Mich. "Wheeler."

**GRIPS, Steering Wheel**

Parker, Stearns & Co., Sheffield & Belmont  
 Aves., Brooklyn, N. Y. "Alpha."

**GRIPS, Throttle & Spark Lever**

American Enamel Co., Providence, R. I.  
 (Enameled wood.)  
 Pennsylvania Rubber Co., Jeannette, Pa.

**HAIR, For Cushions**

(See Cushion Fillings.)

**HAMPERS**

(See also Baskets.)

- A-Z Co., The, 527-29 W. 56th St., N. Y. City.  
 "A-Z." (Metal.)  
 Heywood Bros. & Wakefield Co., Boston, Mass.  
 MacDonald & Campbell, 1334-36 Chestnut St.,  
 Phila., Pa.  
 ★Motor Car Supply Co., The, 1451-55 Michigan  
 Ave., Chicago, Ill.  
 Paragon Auto-Parts Co., The, 1709-1711 Broad-  
 way, N. Y. City.  
 Seitz, Chas., 512 Third Ave., N. Y. City.  
 (Reed.)  
 Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
 ★Winship, W. W., 71 Summer St., Boston,  
 Mass.

**HAND SOAP**

(See Cleansing Compounds, Hand.)

**HANDLES**

(See Hardware.)

**HANDLE BARS, Cycle & Motor-cycle**

- Chicago Motorcycle Works, 732 Sheridan Rd.,  
 Chicago, Ill. (To order.)  
 Consolidated Mfg. Co., Toledo, O. "Hussey."  
 Detroit Seamless Steel Tubes Co., 804 Union  
 Trust Bldg., Detroit, Mich. (Motorcycle.)  
 Geer, Harry R. Co., 856 McLaran St., St.  
 Louis, Mo. (Motorcycle.)  
 Ideal Plating Co., Inc., Marlboro, Mass.  
 "Ideal" & "Acme."  
 Kelley Handle Bar Co., 5017 Perkins Ave.,  
 Cleveland, O. "Kelly" (cycle).  
 Motorcycle Specialty Co., The, 258 Columbus  
 Ave., Boston, Mass. (Spring, for motor-  
 cycles.)  
 ★Reading Standard Co., Reading, Pa.  
 Reese, S. Machine & Tool Works, 224 W. Main  
 St., Plymouth, Pa.

**HARDENING & METAL TREATMENT**

- Ashley Machine Works, 714 University Ave.,  
 Rochester, N. Y. (Hardening.)  
 Bliss, E. C. Mfg. Co., 91 Sabin St., Provi-  
 dence, R. I. (Case hardening.)  
 Cassidy-Fairbank Mfg. Co., The, 6106-6130  
 La Salle St., Chicago, Ill. (Hardening &  
 tempering.)  
 Detroit Screw Works, Detroit, Mich. (Hard-  
 ened & ground work.)  
 Granger Drop Forge Works, West 48th Ave. &  
 16th St., Chicago, Ill. (Tempering, case  
 hardening & carbonizing.)  
 Park Drop Forge Co., The, 730 E. 79th St.,  
 Cleveland, O. (Heat treatment of steel.)  
 Peninsular Milled Screw Co., Champlain &  
 Canton Aves., Detroit, Mich. (Case hard-  
 ening.)  
 Steel Treatment Co., 108 N. Clinton St., Chi-  
 cago, Ill.  
 Worcester Pressed Steel Co., Barber & North  
 Aves., Worcester, Mass. (Case hardening  
 & annealing.)

**HARD RUBBER RADIATOR CAPS**

(See Radiator Parts.)

**HARDWARE, Auto**

- A-Z Co., The, 527-9 W. 56th St., N. Y. City.  
 Aetna Brass Mfg. Co., The, 4800-4810 Hamil-  
 ton Ave., Cleveland, O. (Brass hinges &  
 brass plates.)  
 Arcade Mfg. Co., Freeport, Ill. (Brass hinges  
 & latches.)  
 Attwood Brass Works, 18-20 Bowery St.,  
 Grand Rapids, Mich. (Handles, snap &  
 strap loops, footman loops.)  
 Bliss, E. C. Mfg. Co., 91 Sabin St., Providence,  
 R. I. (Window lifts, draw pulls, etc.)  
 Champion Safety Lock Co., Geneva, Ohio.  
 (Spring cabinet catches & fasteners.)  
 Cleveland Hardware Co., 45th St. & Lakeside  
 Ave., Cleveland, O. (Top hardware.)

★ indicates Advertisers—see Index in back of book.

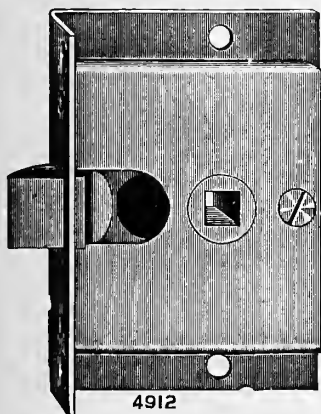


## The Ackerman Automatic Wind Shield

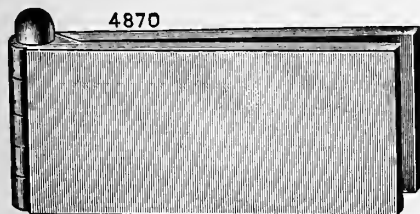


Shuts out the showers.  
 Lets in the sunshine.  $\frac{3}{4}$   
 Adjusted to the change in  
 a twinkling.  
 Combines beauty with sim-  
 plicity and durability.  
 No vexing stops, no jar.  
 Absolutely automatic.  
 Positively rigid, up or down.  
 Brass frame.  
 Mahogany filler-board.

## 1910 Automobile Mountings



Our Hardware is used  
 by the most particular  
 people and the demand  
 is constantly increasing.  
 We invite your inspec-  
 tion and an opportunity  
 to quote on your speci-  
 fications. We know our  
 goods will please you,  
 as they have others.




---

Remember, our line includes every-  
 thing in the way of mountings and  
 trimmings for the automobile. Cat-  
 alog "F-10" is out,—it shows them  
 all,—write for it.

---

### Jos. N. Smith & Company

4th and Porter Sts.

Detroit, Michigan

**HARDWARE, Auto—Continued**

- Colonial Brass Co., New Haven, Conn. (Handles & padlocks.)  
 Cortland Carriage Goods Co., Cortland, N. Y. (Top hardware.)  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. ("Security" locking handles; "New Century" lever locks; "Reliable" & "New Haven" tail board fasteners; "Pray" & "Littlejohn's" apron fasteners; door handles.)  
 Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
 Curry & Abeles, 229 Mulberry St., Newark, N. J. (Hinges & handles.)  
 ★Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich. (Door handles, latches & hinges.)  
 Eagle Lock Co., Terryville, Conn. (Locks.)  
 English & Mersick Co., The, 122-26 Winchester Ave., New Haven, Conn. (Locks, hinges, etc.)  
 English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.  
 Enterprise Brass & Plating Co., The, Cincinnati, O. "Monarch." (Handles.)  
 Forg, Peter, 50 Park St., Somerville, Mass. (Door catches.)  
 Fowler Brass Works, The, Inc., 2333-35 Wabash Ave., Chicago, Ill. (Door handles & footman loops.)  
 Franklin, William H. Brass Foundry Co., Merrimac, Mass.  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn. (Hinges, handles & knobs.)  
 Gifford, John A. & Son, 25 Park Place, N. Y. City.  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O. "Globe." (Brass handles.)  
 Grammes, L. F. & Sons, Allentown, Pa. (Hinges & handles.)  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp." (Handles, to order.)  
 ★Hassall, John, Inc., 183 Lafayette St., N. Y. City. (Escutcheon pins.)  
 Haydenville Co., The, Haydenville, Mass.  
 Hunt & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O. (Hinges.)  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. (Handles.)  
 International Mfg. Co., The, 202 Marine Bank Bldg., Baltimore, Md. "Economy." (Tool box locks.)  
 Ives, The H. B. Co., 11-17 Artizan St., New Haven, Conn. (Window lifts & door pulls.)  
 ★Jonah & George, Merrimac, Mass. (Handles, footman & snaploops.)  
 Keeler Brass Co., Grand Rapids, Mich. ("Keeler" handles, hinges, heel board catches, locks, strap & snap fittings, sash lifts, etc.)  
 Keyless Lock Co., The, Indianapolis, Ind. (Hinges & seat handles.)  
 Lockwood Co., The, 34 Mechanic St., Newark, N. J. (Handles & curtain rollers.)  
 Lynch Mfg. Co., Madison, Wis. (Lock buckles.)  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Perfection."  
 Monarch Carriage Goods Co., 2838-44 Spring Grove Ave., Cincinnati, O. (Top.)  
 Murdock, The James, Jr., Co., 112 Opera Place, Cincinnati, O. (Handles, etc.)  
 Murphy, The G. W. J. Co., Merrimac, Mass. "Murphy." (Handles, strap & snap loops, etc.)  
 National Lock Washer Co., 65 Johnson St., Newark, N. J. "National." (Sash locks & balances.)  
 Neider, F. A. Co., Augusta, Ky. (Steel knobs.)  
 North & Judd Mfg. Co., New Britain, Conn. "Anchor Brand." (Snap hooks & loops, strap buckles, rings & footman loops.)  
 O'Brien, Jas. F. Co., 63 Park Pl., N. Y. City. (Door handles & hinges.)  
 ★Ochner, The A. & Sons Co., New Haven, Conn. (Locks & hinges.)  
 Ohio Brass Co., Mansfield, O. (Hinges, to order.)  
 Parry, A. N. & Co., Amesbury, Mass. (Anti-rattling window strips.)  
 Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O. (Locks.)  
 Phoenix Lock Works, 321 3rd Ave., Newark, N. J. (Handles & tool box hasps.)  
 Reinke & Shirray Mfg. Co., 445-453 Lafayette Blvd., Detroit, Mich. (Locks & special hardware.)  
 Rochester Safety Lock Co., Rochester, Ind. (Locks.)  
 Sargent & Co., 94 Centre St., N. Y. City. (Door catches.)  
 Scherer, H. & Co., Detroit, Mich.  
 Shelby Spring Hinge Co., The, Shelby, Ohio. (Hinges, handles, sash lifts, etc.)  
 ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich. (Locks, hinges, heel board catches, finishing screws, tool box hasps, deck latches, dowels & window fixtures.)  
 Soss Mfg. Co., 245 Broadway, N. Y. City. (Door hinges.)  
 Spencer's, I. S. Sons, Guilford, Conn.  
 Spencer Wire Co., Worcester, Mass. (Strap buckles.)  
 Stanley Works, Lake St., New Britain, Conn. (Hinges.)  
 Sutherland, The F. L. Co., Detroit, Mich. (Footman, snap & strap loops.)  
 Strong, M. H., 168 South Ave., Rochester, N. Y. (Door handles.)  
 Ten Eick, Cornelius, 253 W. 47th St., N. Y. City. (Locks, hinges & handles.)  
 Turner Brass Works, The, Sycamore, Ill. (Handles.)  
 Turner & Seymour Mfg. Co., Torrington, Conn. "Star." (Brass escutcheon pins.)  
 Wainwright, W. W. & Son, 16th & Western Ave., Connersville, Ind. (Door hinges.)  
 Waterbury Brass Goods Corp., The, 160 Washington Ave., Waterbury, Conn. (Hood & lamp hinges.)  
 Waterbury Mfg. Co., Waterbury, Conn. (Hinges.)  
 Western Brass Manufacturing Works, 21st & Campbell Ave., Chicago, Ill.  
 ★White Mfg. Co., 155 Cannon St., Bridgeport, Conn. (Handles.)  
 Wing, Chas. Co., The, Amesbury, Mass.  
 Woodruff, Walter W. & Son Co., Mt. Carmel, Conn. "Eagle" & "Mt. Carmel" (brass snap & strap loops, handles, door stops, locks & hinges.)  
 ★Yale & Towne Mfg. Co., The, 9 Murray St., N. Y. City. "Yale." (Locks and padlocks.)

**HARDWARE, Marine**

- Blasier, M. E. Mfg. Co., The, 65-67 Columbia St., Utica, N. Y.  
 Carpenter, Geo. B. & Co., 202-08 S. Water St., Chicago, Ill.  
 ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. (Brass chains.)  
 Durkee, C. D. & Co., Inc., 2 South St., N. Y. City.  
 Franklin, William H. Brass Foundry Co., Merrimac, Mass.  
 Haydenville Co., The, Haydenville, Mass.  
 Jones & Schumacher, 1100 West St., Wilmington, Del.  
 Kaufmann, Chas., 28 Main St., Oshkosh, Wis.  
 Laughlin, The Thos. Co., 143 Fore St., Portland, Me.  
 Michigan Wheel Co., Canal & Legrande Sts., Grand Rapids, Mich.  
 Midland Metal Co., Inc., 21st & Jefferson Sts., Phila., Pa.  
 Noank Motor Co., The, Noank, Conn.

## HARDWARE, Marine—Continued

Phoenix Lock Works, 321 3rd Ave., Newark, N. J.  
Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City. (Brass fittings.)  
Sargent & Co., 94 Centre St., N. Y. City. (Brass.)  
Tallmadge, J., Baldwinville, N. Y.  
Truscott Boat & Auto Supply Co., St. Joseph, Mich.  
Turner Brass Works, The, Sycamore, Ill. (Awning fastenings.)

O'Connor, Thos. E., 14-16 Town Hall, Saratoga Springs, N. Y.  
Standard Stamping Co., Marysville, Ohio. "Standard."

## HEEL BOARDS

Hanson-Ward Veneer Co., Bay City, Mich.  
Holland Veneer Works, Holland, Mich.

## HASSOCKS

(See Foot Rests.)

## HINGES

(See Hardware.)

## HAT HANGERS

Central Brass & Fixture Co., The, Springfield, Ohio. "Buckeye."

## HEADLIGHTS

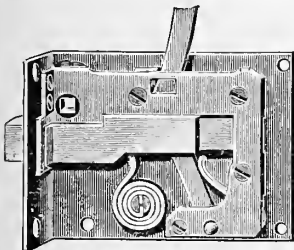
(See Lamps.)

## HOODS, Motor

A-Z Co., The, 527-29 W. 56th St., N. Y. City. "A-Z."  
Aepinus-Haggstrom Mfg. Co., 1502 Michigan Ave., Chicago, Ill.  
Auto Radiator Repairing Co., 1317 Vine St., Phila., Pa.  
Auto Re-Building Co., 1307-09 Wabash Ave., Chicago, Ill. "Arco."  
Auto Sheet Metal Works, 2228 Michigan Ave., Chicago, Ill.  
Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass.  
Berger Mfg. Co., Canton, O.  
Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Mich.  
Bush Mfg. Co., 81 Commercial St., Hartford, Conn. "Bush."  
Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O.  
Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich.  
★Fedders Mfg. Works, 57-59 Tonawanda St., Buffalo, N. Y. "Fedders."  
Fleetwood Metal Body Co., Fleetwood, Pa. "Fleetwood."  
Folsom, C. G. Mfg. Co., South Bend, Ind.  
Gates-Osborne Mfg. Co., Marshalltown, Ia.  
Geuder, Paeschke & Frey Co., St. Paul Ave., & 15th St., Milwaukee, Wis.  
Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich.  
Hill Dryer Co., 344 Park Ave., Worcester, Mass.  
Kells, W. J. Mfg. Co., 726-28 Eleventh Ave., N. Y. City.  
Keystone Sheel Metal Co., Ambridge, Pa.

## HEATERS, Automobile

American Auto Heater Co., Inc., 160 14th St., Buffalo, N. Y. "American."  
Automobile Heater Co., 1133 Broadway, N. Y. City. "Pele."  
Chicago Flexible Shaft Co., Chicago, Ill. "Clark," "Duchess" & "7X."  
Cincinnati Auto Heater Mfg. Co., 115 E. Liberty St., Cincinnati, O.  
Cooper Heater Co., Dayton, O. "Cooper." (Hot water.)  
Ensminger, Chas. C., Shelbyville, Ind.  
Lehman Bros., 10 Bond St., N. Y. City. "Star" & "Lehman."  
Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radio."  
Motor Mfg. Works Co., The, Foot of Middle St., Geneva, N. Y. "Rational."  
National Casket Co., 50 Great Jones St., N. Y. City.  
Novelty Mfg. Co., Jackson, Mich. "X"- "Radium."



## MANUFACTURERS OF

# LOCKS and HINGES

For Automobiles, Coaches, Hearses and Undertakers' Wagons

## ALSO BODY MAKERS' TOOLS

Locks, Hinges and Fixtures for All Kinds of Automobiles

# The A. Ochsner & Sons Co., New Haven Conn.

★ indicates Advertisers—see Index in back of book.

**HOODS, Motor—Continued**

- Kinsey Mfg. Co., Toledo, O. "Kinwood."  
Lockport Stamping Co., Race St., Lockport, N. Y. "Lockport."  
★Long Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.  
★Mayo Radiator Co., The, State & Mill River Sts., New Haven, Conn. "Mayo."  
Metal Stamping Co., Jackson, Mich.  
Mullins, W. H. Co., Salem, O. (Metal.)  
Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo. (Metal & wood.)  
New Britain Sheet Metal Co., New Britain, Conn.  
Novelty Mfg. Co., Jackson, Mich. "Novelty."  
Noye Mfg. Co., Buffalo, N. Y.  
Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O.  
Paragon Auto-Parts Co., The, 1709-1711 Broadway, N. Y. City.  
Quinby, J. M. & Co., 21-39 Division St., Newark, N. J. (Aluminum.)  
Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City.  
Reliance Auto Parts Mfg. Co., 244-250 W. 49th St., N. Y. City.  
Sheet Metal Auto Parts Works, 201 W. 48th St., N. Y. City.  
Springfield Metal Body Co., 364 Birnie Ave., Springfield, Mass. (Aluminum & steel.)  
Steiner Mfg. Co., 144-46 Howard Ave., Newark, N. J.  
Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
Toops Automobile Hood Co., The, Indianapolis, Ind. "Toops." (Folding.)  
Whitlock Coil Pipe Co., The, Hartford, Conn.  
Wright Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill. "Wright."

**HOOD PARTS**

- Bossert Co., The, Utica, N. Y. (Supports, to order.)  
Curry & Abeles, 229 Mulberry St., Newark, N. J. (Fasteners.)  
★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y. (Supports.)  
Hammacher, Schlemmer & Co., 13th St. & 4th Ave., N. Y. City. "H. S. & Co." (Hinges.)  
Holland Veneer Works, Holland, Mich. (Sills.)  
★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. (Hood fasteners.)  
Keeler Brass Co., Grand Rapids, Mich. "Keeler." (Hood fasteners, handles, hinges, latches & door bumpers.)  
Kinsey Mfg. Co., Toledo, Ohio. "Kinwood." (Handles, hinges, spring fasteners & arch bars.)  
Medina Machine & Stamping Co., Medina, N. Y. (Hood fasteners.)  
Phoenix Lock Works, 321 3rd Ave., Newark, N. J. (Hood handles.)  
Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J. (Reeds.)  
Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill. (Hood locks.)  
Woodruff, The, Walter W. & Sons Co., Mt. Carmel, Conn. (Fasteners & hinges.)

**HORNS, Bulb Auto**

- American Brass Products Co., Hartford, Conn. "Volier." (Imported.)  
★American Thermo-Ware Co., 16 Warren St., N. Y. City. (Imported.)  
Autolyte Mfg. Co., The, 26 Warren St., N. Y. City. "Signal." (Imported.)

- Automobile Supply Mfg. Co., 224 Taaffe Pl., Brooklyn, N. Y. (Siren.)  
Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.  
Ball-Fintze Co., The, Newark, O. "Avalon."  
Donaldson & Fisher Co., 218-220 W. Kinzie St., Chicago, Ill.  
Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-man-Co."  
Hero Mfg. Co., Gaul & Adams Sts., Phila., Pa.  
Motor Car Equipment Co., The, 55 Warren St., N. Y. City.  
★Motor Car Supply Co., The, 1451-1455 Michigan Ave., Chicago, Ill. (Sirens.)  
New York Auto Lamp Co., 68 Clarkson St., N. Y. City.  
★Nonpareil Horn Mfg. Co., 139-147 Emerson Pl., Brooklyn, N. Y. "Nonpareil."  
Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J.  
Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J. "Standard."  
Stevens & Co., 375 Broadway, N. Y. City. "Esco."  
Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn. "Leavitt Siren."

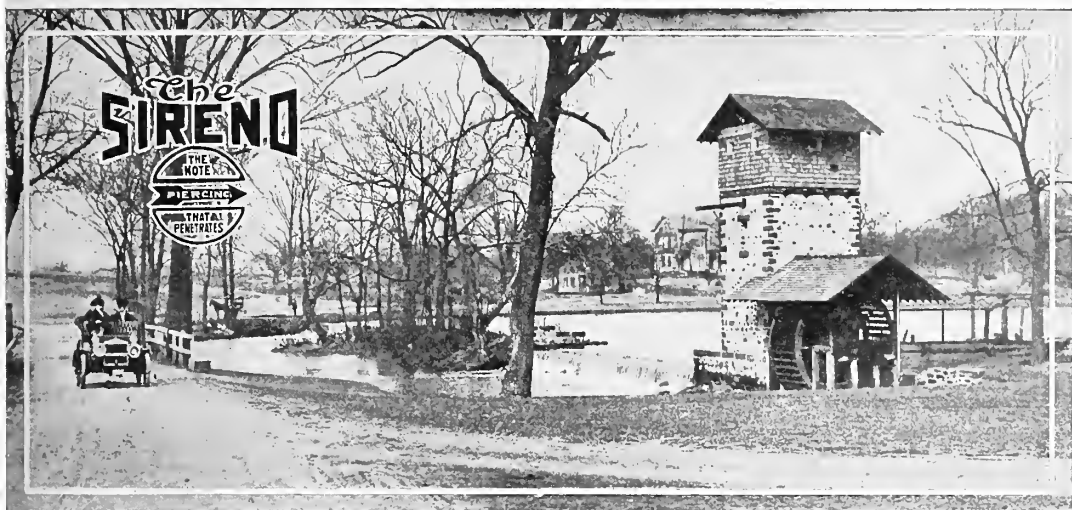
**HORNS, Electric Auto**

- ★Atwater-Kent Mfg. Co., 42-46 N. 6th St., Phila., Pa. "Monoplex."  
Electric Auto Horn Co., 6112 Station St., Pittsburg, Pa. "Duplex."  
Elkhart Dry Battery & Signal Co., 117 Commercial St., Elkhart, Ind. "Electro-Corno."  
Gary, Theo. H. Co., 50-52 Franklin St., N. Y. City. "Grack-Unicum." (Imported.)  
Guarantee Tire & Rubber Co., The, 208-10 S. Illinois St., Indianapolis, Ind. "Long Distance."  
★Holtzer-Cabot Electric Co., Boston, Mass. "Autobis."  
Improved Electro Corno Co., 48 West 34th St., N. Y. City. "Improved Electro Corno."  
Jones Speedometer, The, Broadway & 76th St., N. Y. City. "Jones."  
Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J. "Klaxon."  
O'Brien Electrophone Co., Inc., Hallowell, Me.  
Russell Electric Co., The, Danbury, Conn. "Saxon" & "Saxon, Jr."  
★Sireno Co., The, 39-41 Cortland St., N. Y. City. "Sireno." (Sirens.)

**HORNS, Exhaust Auto**

- (See also Whistles, Automobile.)  
Balzer, Gus, 1777-79 Broadway, N. Y. City. (Humming.)  
Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco." (Fourtone chimes.)  
★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Blue Ribbon."  
Echo Horn Co., The, 5601 Carnegie Ave., Cleveland, O. "Echo."  
Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill. "F. & K." & "Husk." (Chimes.)

★ Indicates Advertisers—see Index in back of book.



## THE MILE-AHEAD ELECTRIC SIGNAL

### THE PIERCING NOTE THAT COMPELS ATTENTION

Distance penetrating automobile signals must increase their "reaching" powers in direct proportion to the marked increase in the speed capabilities of the car—the higher the speed, the further ahead must the signal warn.

This is the day of the high-gear, high-powered cars.

And it is the day of the SirenO—the high-powered, penetrating signal—the horn with a voice of volume and strength great enough to project your warning message a mile ahead on a country road.

Gradually, but with irresistible force, the importance of the Long Distance Signal Horn is being borne in on the minds of the motoring public. If your own observations have not confirmed this statement, let us give you some facts to substantiate this assertion:

In the last twelve months the demand for the SirenO Electric Horn has developed so rapidly that the company's output has increased four times over that of the preceding year! From all indications the year 1910 will see even greater progress!

The SirenO—the "Press-the-Button" type—the horn that is operated from the ignition battery—that responds instantly with an unmistakable note of warning is the only one that will fulfil your every requirement, insure your safety and comfort, and that of countless others.

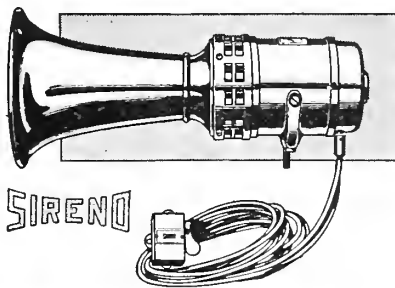
The SirenO has a commanding individuality of sound which is bound to attract attention where the low, vibrating note of the ordinary signaling device is common enough to be unheeded.

The SirenO is manufactured in eight styles and sizes—a horn for every car, from the smallest runabout to the largest touring car. They may be seen at your dealer's or we will be glad to mail you further information contained in our catalog, which is just from the press.

Electric Warning  
Signals and  
Accessories

**SIRENO**

1603 Taylor Bldg.  
New York  
U. S. A.



### HORNS, Exhaust—Continued

- ★Gabriel Horn Mfg. Co., 1407 E. 40th St., Cleveland, O. "Gabriel."
- ★Gray-Hawley Mfg. Co., 605-09 Fort St., W. Detroit, Mich. "Autochimes."
- Harper, Thos. 139-145 Lafayette St., N. Y. City. "Harp." (Chimes.)
- King Dodo Horn Co., Piqua, O.
- New York Coach & Auto Lamp Co., 794-98 10th Ave., N. Y. City. "Universal."
- ★Nightingale Whistle Mfg. Co., 1777 Broadway, N. Y. City. "Nightingale."
- Peterson, T. J. Co., Security Bldg., Chicago, Ill. "B. & H."
- ★Randall-Faichney Co., 251 Causeway St., Boston, Mass. "Jericho."
- Universal Wind Shield Co., 130-34 S. Clinton St., Chicago, Ill. "Universal."
- Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill. (Chimes & chime valves.)

### HORN BULBS

(See Bulbs, Rubber Horn.)

### HORN BULB GUARDS

American Spring & Supply Co., 135 Johnson St., Brooklyn, N. Y. "Asco."  
 Usona Stamping Works, 199 Grand St., N. Y. City.

### HORN PEDALS

(See Pedals.)

### HORNS, Cycle & Motor Cycle

- Baker, F. A. & Co., 37 Warren St., N. Y. City. (Motorcycle.)
- Donaldson & Fisher Co., 218-220 W. Kinzie St., Chicago, Ill. (Motorcycle.)
- ★Nightingale Whistle Mfg. Co., 1777 Broadway, N. Y. City. "Nightingale." (Motorcycle.)
- Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J. (Cycle and motorcycle.)
- ★Sireno Co., The, 39-41 Cortland St., N. Y. City. (Motorcycle, electric, also shaft driven sirens.)
- Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J. "Standard."

### HORN PARTS

- Motor & Mfg. Works Co., The, Foot of Middle St., Geneva, N. Y. (Valves.)
- ★Nonpareil Horn Mfg. Co., 139-147 Emerson Pl., Brooklyn, N. Y. "Nonpareil." (Horn reeds.)
- Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J. "Standard." (Reeds.)
- Stevens & Co., 99 Chambers St., N. Y. City. (Reeds.)

### HORNS, Motor Boat

- American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City. "E-Z-Blow."
- ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
- Elkhart Dry Battery & Signal Co., 117 Commercial St., Elkhart, Ind. "Electro-Corno." (Electric.)
- ★Holtzer-Cabot Electric Co., Boston, Mass. (Electric.)
- Improved Electro Corno Co., 48 West 34th St., N. Y. City. "Improved Electro Corno." (Electric.)
- Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.

### HORN SCREENS

(See Wire Cloth.)

### HORN TUBES

(See Tubing, Rubber.)

### HORN BLOWERS

- Fowler Brass Works, Inc., 2333-35 Wabash Ave., Chicago, Ill. "Fowler." (Metal.)
- King Dodo Horn Co., Piqua, O.
- Rolfe, C. D., Redlands, Cal. "Auto-Horn." (Electric.)
- Wordingham Auto Supply Co., 803 Grand Ave., Milwaukee, Wis. "Wordy." (Auto.)

### HOSE

- Barnard, Wm. H. Rubber Co., 257 S. 4th St., Phila., Pa. (Rubber.)
- Boston Belting Co., 256-60 Devonshire St., Boston, Mass. "Excelsior," "Boston" & "Niagara." (Rubber.)
- Cincinnati Rubber Mfg. Co., The, Cincinnati, Ohio. (Rubber.)
- Combination Rubber Mfg. Co., Bloomfield, N. J.
- Hamilton Rubber Mfg. Co., Trenton, N. J. (Radiator.)

**HOSE—Continued**

- Horton Boat, Engine & Supply Co., 60 South Ave., Rochester, N. Y.  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor." (For compressed air.)  
 Mattson Rubber Co., Lodi, N. J. (Pump, steam & water.)  
 ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. (Radiator.)  
 New York Belting & Packing Co., 91 Chambers St., N. Y. City. (Water.)  
 Pennsylvania Rubber Co., Jeannette, Pa. (Rubber.)  
 Preston Fabric Tire Co., 1400-1410 Niagara St., Buffalo, N. Y. (Cotton.)  
 Quaker City Rubber Co., 629 Market St., Phila., Pa. "Quaker City." (Rubber.)  
 Republic Rubber Co., Youngstown, O.  
 Revere Rubber Co., 77 Bedford St., Boston, Mass.  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City. (Oil.)  
 Schoen-Jackson Co., Media, Pa.  
 Snyder, M. L., 9 North 4th St., Phila., Pa. (Waxed fire.)  
 Sprague Electric Co., 527-31 W. 34th St., N. Y. City. (Flexible steel armored.)  
 ★Thermoid Rubber Co., Trenton, N. J.  
 United & Globe Rubber Mfg. Co., Trenton, N. J. "Safety," "Alpha," "Globe," "Electric" & "Magic." (Rubber.)  
 U. S. Flexible Metallic Tubing Co., 450 E. 3rd St., Los Angeles, Cal. (Metal.)  
 Western Oil Pump & Tank Co., 2437 Kosciusko St., St. Louis, Mo. (Flexible metal.)  
 Westinghouse Air Brake Co., Pittsburg, Pa. (For connecting up air compressors.)

**HOSE COUPLINGS**

- Balzer, Gus, 1777-79 Broadway, N. Y. City. (Clamps.)  
 Clancy, J. R., 249 N. Salina St., Syracuse, N. Y. "Sure Grip."  
 Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, O. ("Bowes," for compressed air; "Never-Slip" hose clamps.)  
 Erickson, P. E. & Son, Port Chester, N. Y.  
 ★Globe Machine & Stamping Co., The, 3956 Hamilton Ave., Cleveland, O.  
 Haydenville Co., The, Haydenville, Mass.  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor." (For compressed air.)  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O. (Clamps.)  
 Krahn Mfg. Co., Milwaukee, Wis. "Krahn."  
 ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I.  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City.  
 ★National Tube Co., Frick Bldg., Pittsburg, Pa. (Air couplings; clamps.)  
 Ripley Pipe Wrench Co., Ripley, N. Y. "Leader." (Air & water.)  
 ★Rohrbacher Automatic Air Pump Co., 173 E. Water St., Portland, Ore. "Rohrbacher."  
 ★Schrader's, A. Sons, Inc., 28-32 Rose St., N. Y. City. (Hose clamps & couplings.)  
 Sherman, H. B. Mfg. Co., 12 Barney St., Battle Creek, Mich. "Sherman." (Also hose clamps.)  
 ★Thermoid Rubber Co., Trenton, N. J. "Imperial." (Compression couplings.)  
 Westinghouse Air Brake Co., Pittsburg, Pa. (Couplings & nozzles for air compressor hose.)  
 ★Youse & Daddow, 46 N. 5th St., Reading, Pa. (Compressed air.)

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**OUR** exclusive styles, finish, and quality are worthy of the name we bear, and can only be obtained by our up-to-date system of manufacturing, superintended by master mechanics. We also can supply you with heavy pliable bulbs, reeds non-corrosive, flexible tubing asbestos-lined.

## Nonpareil Horn Manufacturing Co.

139-147 Emerson Place, Brooklyn, N. Y.



**HOUSES, Portable Auto**

(See Garages, Portable.)

American Portable House Co., 329 Arcade Bldg., Seattle, Wash.  
 Atlas Portland Cement Co., 30 Broad St., N. Y. City. "Atlas Portland." (Cement.)  
 Berger Mfg. Co., Canton, O.  
 Burnham-Standeford Co., Oakland, Cal.  
 Chesebro, Whitman Co., 64th St. & First Ave., N. Y. City.  
 Craig, The David Co., 68-70 Broad St., Boston, Mass. "Craig." (Concrete.)  
 Hodgson, E. F. Co., 116-118 Washington St., Boston, Mass. "Hodgson."  
 Huff, E., Jr., 51 Union St., Portland, Me. "Huff."  
 Ideal Sectional Building Co., North Tonawanda, N. Y.  
 Kenyon, The R. L. Co., Waukesha, Wis.  
 Knapp Portable-Permanent Building Co., 5 E. 42nd St., N. Y. City.  
 Lawrence Portland Cement Co., 1 Broadway, N. Y. City. "Dragon." (Cement concrete for garages.)  
 Lewis Corrugated Culvert Co., Elyria, Ohio. (Fireproof.)  
 Merston & Morley Co., Saginaw, Mich.  
 New York Portable Bungalow Co., Poughkeepsie, N. Y.  
 Nicola Building Co., Farmers' Bank Bldg., Pittsburg, Pa. "Economy."  
 Portable Construction Co., Hudson Terminal, 50 Church St., N. Y. City.  
 Sectional House Co., 72 East St., Walpole, Mass. (Sectional.)  
 Springfield Portable House Co., 602 Allen St., Springfield, Mass.  
 Stewart, F. L. Building & Realty Co., 607 Liggett Bldg., St. Louis, Mo.

**HOUSES, Boat**

Kenyon, R. L. Co., Waukesha, Wis. (Portable.)  
 Knapp Portable-Permanent Building Co., 5 E. 42nd St., N. Y. City.  
 Lewis Corrugated Culvert Co., Elyria, O.  
 New York Portable Bungalow Co., Poughkeepsie, N. Y.  
 Sectional House Co., 72 East St., Walpole, Mass. (Sectional.)

**HOUSES, Motor Cycle**

Cullen-Atkinson Co., Hartford, Conn. (Sheet steel.)  
 New York Portable Bungalow Co., Poughkeepsie, N. Y.

**HUBS, Automobile**

American Ball Bearing Co., Edgewater Park & L. S. & M. S. Ry., Cleveland, O.  
 Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.  
 Baltimore Hub-Wheel & Mfg. Co., 326-32 N. Holliday St., Baltimore, Md.  
 Deschler, August, 18-20 E. Water St., Chillicothe, O.  
 ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. "Diamond."

K. H. Wheel Co., 1208-50 Military Ave., Detroit, Mich.  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y.  
 ★Liggett Spring & Axle Co., Park Bldg., Pittsburg, Pa.  
 Mott Wheel Works, Pleasant St., Utica, N. Y.  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.  
 ★Timken-Detroit Axle Co., The, Clark Ave. & Pere Marquette R. R., Detroit, Mich.  
 ★Tippett Mfg. Co., The, 172-82 W. Locust St., Columbus, O.  
 Weston-Mott Co., Flint, Mich. "Weston-Mott."  
 Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.

**HUB CAPS**

Bossert Co., The, Utica, N. Y. (To order.)  
 ★Bowen Mfg. Co., Mechanic St., Auburn, N. Y.  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Curry & Abeles, 229 Mulberry St., Newark, N. J. (Hub bands.)  
 Ford Metal Specialty Co., 55 State St., Chicago, Ill.  
 Fowler Brass Works, Inc., The, 2333-35 Wabash Ave., Chicago, Ill.  
 ★Globe Machine & Stamping Works, The, 3950 Hamilton Ave., N. E., Cleveland, O.  
 Hartford Machine Screw Co., Hartford, Conn.  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 Ireland & Matthews Mfg. Co., Detroit, Mich. "I & M."  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
 Matthews, The H. A. Mfg. Co., Seymour, Conn.  
 Murdock-Shaw Co., 125 Federal St., Boston, Mass.  
 ★National Tube Co., Frick Bldg., Pittsburg, Pa.  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Scheweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich.  
 ★Standard Welding Co., 76th St., N. W. & L. S. & M. S. R. R., Cleveland, O.  
 Stoll Pressed Steel Co., Buffalo, N. Y.  
 Torrey Roller Bushing Works, Bath, Me.

**HUB FLANGES**

Bossert Co., The, Utica, N. Y. (To order.)  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Driggs-Seabury Ordnance Corp., Sharon, Pa.  
 Hartford Machine Screw Co., Hartford, Conn.  
 ★Hydraulic Pressed Steel Co., The, Cleveland, Ohio.  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y.  
 ★National Tube Co., Frick Bldg., Pittsburg, Pa.  
 Parish Mfg. Co., 7th & Chestnut Sts., Reading, Pa.  
 ★Standard Welding Co., 76th St., N. W., & L. S. & M. S. R. R., Cleveland, O.  
 ★Tippett Mfg. Co., The, 172-82 W. Locust St., Columbus, O.

★ indicates Advertisers—see Index in back of book.

**HUBS, Cycle & Motor Cycle**

- ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor." (Cycle.)
- ★Corbin Screw Corporation, New Britain, Conn. (Front.)
- ★Eclipse Machine Co., Elmira, N. Y. "Eclipse." Northway, Thos. J., 92 Exchange St. Rochester, N. Y. (Motorcycle front.)
- Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.

**HULLS, Boat**

- Cleveland Auto Boat Mfg. Co., 1036 River Ave., Cleveland, O. (Partially completed.)
- Defoe Boat & Motor Works, Bay City, Mich. (Knock-down.)
- Niagara Motor Boat Co., North Tonawanda, N. Y. (Knock-down.)
- Ripley Steel Boat Co., Box O, Grafton, Ill. "Ripley." (Knocked down, steel.)
- Tallmadge, J., Baldwinville, N. Y. (Planking.)
- Valley Boat & Engine Co., Baldwinville, N. Y. "American."

**HULL COATING**

- Gardner, George N. & Son, 15 William St., N. Y. City. "American McInnis."
- ★New Jersey Paint Works, Cor. Wayne & Fremont Sts., Jersey City, N. J.

**IGNITERS**

(See Spark Plugs, Magnetos, Dynamos, Magnetic Spark Plugs & Timers.)

**IGNITION CABLE BAR**

- ★Diamond Rubber Co., Akron, O. "Diamond." (Hard rubber.)

**IGNITION APPARATUS, Miscellaneous**

- Altemus Mfg. Co., The, 42nd & Chestnut Sts., Phila., Pa. "Rhoades." (Unit sparker.)
- American Platinum Works, 251 N. J. R. R. Ave., Newark, N. J. (Platinum & platinum iridium sparking points.)
- ★Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa. "Spark Generator" & "Unisparker." (Coil, distributor & contact maker.)

- Baker & Co., Newark, N. J. "Baker." (Sparking point for marine and auto engines; platinum & iridium platinum wire.)
- Boker, Herman & Co., 101 Duane St., N. Y. City. "Meteor." (Wire for sparking points.)
- Briggs & Stratton Co., Milwaukee, Wis. "B & S" & "Star." (Igniter.)
- Croselmaire & Ackor Co., 42 Walnut St., Newark, N. J. (Platinum sparking points.)
- Dayton Electrical Mfg. Co., The, 89 St. Clair St., Dayton, O. (Combined igniting & lighting outfits.)
- Dayton Engineering Laboratories Co., The, Dayton, O. "Delco." (Ignition systems.)
- Dunton, The M. W. Co., Providence, R. I. (Cotton tapes & sleeveings for armature repairing.)
- Electrical Goods Mfg. Co., Canton, Mass. "Perfect." (Waterproof ignition systems.)
- Frankel Display Fixture Co., 177 Hudson St., N. Y. City. (Testing clips.)
- Jacobson-Brandow Co., 126 Columbus Ave., Pittsfield, Mass. "J. & B." (Vibrator & spark indicator.)
- Leece-Neville Co., Cleveland, O. (Generators.)
- ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill. (Switch plugs & levers, points and vibrators.)
- New Britain Mfg. Co., New Britain, Conn. "Red Devil." (Vibrators.)
- Ney, The J. M. Co., Hartford, Conn. (Platinum wire.)
- Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich. (Spark plug shells.)
- ★Rajah Auto Supply Co., Bloomfield, N. J. (Nipples.)
- Roessler & Hasslacher Chemical Co., 100 William St., N. Y. City.
- Stackpole Battery Co., St. Marys, Pa. (Carbon cylinders, carbon brushes & plates.)
- Stecker Electric & Machine Co., Detroit, Mich. "Stecker."
- Whisler Mfg. Co., Port Huron, Mich. "Whisler." (Dual system.)

**IGNITION BATTERIES, Dry**

(See Batteries, Ignition; Dry.)

**IGNITION BATTERIES, Storage**

(See Batteries, Ignition; Storage.)

**IGNITION CABLE**

- American Steel & Wire Co., 115 Adams St., Chicago, Ill.
- Benedict & Burnham Mfg. Co., Waterbury, Conn. "K. K."
- ★Bishop Gutta-Percha Co., 428 E. 25th St., N. Y. City. "Bishop" (also rubber insulated wire.)
- ★Bosch Magneto Co., 223-225 W. 46th St., N. Y. City.
- Boston Insulated Wire & Cable Co., 182-186 Freeport St., Boston, Mass.

**IGNITION CABLE—Continued**

- Cartridge Coil Co., LaFayette, Ind.  
 Central Insulating Co., LaFayette Ind., (Also enamel insulated wire.)  
 Champion Co., The, 36 Whittier St., Boston, Mass. "Champion."  
 Champion Ignition Co., Flint, Mich. (Imported.)  
 ★Diamond Rubber Co., Akron, O. "Diamond." (Rubber covered.)  
 ★Empire Tire Co., Trenton, N. J. "Empire."  
 ★General Electric Co., Schenectady, N. Y. "G. E."  
 Grossman, Emil Co., 232 W. 58th St., N. Y. City. "Red Rib."  
 Habirshaw Wire Co., 253 Broadway, N. Y. City. "Habirshaw."  
 Hazard Mfg. Co., Wilkes-Barre, Pa.  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Herz."  
 ★Indiana Rubber & Insulated Wire Co., Jonesboro, Ind. (Also wires.)  
 Kerite Insulated Wire & Cable Co., 30 Church St., N. Y. City. (Insulated wire.)  
 Manhattan Dental Co., New Times Bldg., N. Y. City. (Non-fusing platinoide wire.)  
 Motor Car Equipment Co., The, 55 Warren St., N. Y. City. "Pirelli." (Imported.)  
 National Sales Corporation, 232 W. 58th St., N. Y. City. "Pirelli." (Imported.)  
 New York Insulated Wire Co., 14 Liberty St., Boston, Mass. "New York."  
 Nilmelior Electrical Co., 1789 Broadway, N. Y. City. (Imported.)  
 Okonite Co., The, 253 Broadway, N. Y. City. "Okonite."  
 ★Packard Electric Co., Warren, Ohio. "Packard."  
 Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. "Immunity" & "Para Flex."  
 Roebing's, Jno. A. Sons Co., Trenton, N. J.  
 Safety Insulated Wire & Cable Co., 114 Liberty St., N. Y. City.  
 ★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal.  
 Shain, Chas. D., 70 Murray St., N. Y. City. "Shain's."  
 Simplex Electrical Co., 110 State St., Boston, Mass. "Simplex." (Insulated wire.)  
 Spencer Wire Co., Worcester, Mass. (Spark coil and spark plug wire.)  
 Standard Underground Cable Co., Pittsburg, Pa.  
 Western Electric Co., The, 465 West St., New York, N. Y. "Hawthorne."  
 Witherbee Igniter Co., 1876 Broadway, N. Y. City. "Wico."  
 Wright Wire Co., Worcester, Mass. (Spark coil wire.)

**IGNITION DYNAMOS & MAGNETOS**

(See "Dynamos, Ignition," and "Magneto, Ignition.")

**IMITATION LEATHER**

(See Leather, Trimming, Top Materials & Upholstering Materials.)

**IMPORTERS, Auto Goods**

- American Brass Products Co., Hartford, Conn. "Volier." (Horns.)  
 ★American Thermo-Ware Co., 16 Warren St., N. Y. City. ("La Parfaite" & "Autocrat" goggles & "Autocrat" hydrometers, hydrometer, syringes, thermometers, mirrors, horns, "Testophones," clocks, grade-meters, etc.)  
 Andrew, J. H. & Co., 107 West St., N. Y. City. ("Toledo" high speed cutting steel & "Toledo-Sheffield" crucible steel.)  
 Autolyte Mfg. Co., The, 26 Warren St., N. Y. City. ("Signal" horns.)  
 Barrett, M. L. & Co., 219 Lake St., Chicago, Ill. (Gum shellac & bronze powders.)  
 ★Barthel, Daly & Miller, 42 Broadway, N. Y. City. "Schafer" (annular ball bearings.)  
 ★Becker Steel Co., 2226-27 Land Title Bldg., Phila., Pa. (Tool steels, chrome nickel, nickel & Tungsten alloy steels, tool steel tubing, vanadium & vanadium alloys & high speed steels.)  
 Benz Auto Import Co. of America, 1599-1601 Broadway, N. Y. City. "Benz." (Gasoline autos.)  
 Bowman, Sidney B. Automobile Co., 225-231 W. 49th St., N. Y. City. "Clement-Bayard." (Gasoline pleasure cars.)  
 Breakstone, S., 1712 Michigan Ave., Chicago, Ill. ("Lepaute" Taximeters; "Edco" spark plugs, tire lugs, tire valves & lock nuts.)  
 Bretz, J. S. Co., Times Bldg., N. Y. City. ("F. & S." annular ball bearings, German steel balls, "Unterberg & Helmle" master magnetos & Bowden wire.)  
 Brewster & Co., Broadway & 47th St., N. Y. City. "Delaunay-Belleville." (Chassis.)  
 British Napier Motors, 47 Union Ave., Jamaica Plain, Boston, Mass. "British Napier." (Pleasure cars & taxicabs.)  
 C. G. V. Import Co., 49 W. 64th St., N. Y. City. "C. G. V." (Gasoline pleasure cars.)  
 Carr, F. S. Co., 113 Purchase St., Boston, Mass. (Auto linings.)  
 Champion Ignition Co., Flint, Mich. (Ignition cable.)  
 Conti, Cesare, 35-37 Broadway, N. Y. City. "S. P. A." (Gasoline pleasure cars.)  
 Crowley, John A. & Co., 120 Liberty St., N. Y. City. "Arrow." (Tool steel, chrome nickel steel, nickel & spring steel.)  
 Cryder & Co., 53 Park Ave., N. Y. City. ("Hermetic" tire lugs; "Kempshall" non-skid tires—Sole U. S. Agents.)  
 Delahaye Import Co., 2 Rector St., N. Y. City. "Delahaye." (Gasoline pleasure cars & parts & supplies.)  
 Doggett, Stanley, 101 Beekman St., N. Y. City. (French & Italian soapstone for tires.)  
 DeDion Bouton Selling Branch, 1649 Broadway, N. Y. City. "DeDion Bouton." (Gasoline pleasure & commercial cars, aviation motors & motor boat engines.)  
 Dien, Ch., 45 W. 34th St., N. Y. City. "Edco." (Tire lugs & valves, spark plugs, rivets & chrome leather for anti-skid tires.)  
 Ducasse, Henry & Co., 735 7th Ave., N. Y. City. "G. & M." (Radiators.)  
 Duquet, Louis G., 107 W. 36th St., N. Y. City. "Englebert." (Tires, made in Liege, Belgium, & automobile supplies.)  
 Du Vivier, Ernest H., N. Y. City. (Pyrometers & pressure gauges.)  
 Empire Auto Supply Co., 1904 Broadway, N. Y. City.  
 Engelhard, Chas., 32 Cortlandt St., N. Y. City. ("Heraeus Le Chatelier," pyrometers; "Heraeus" electrical furnaces; "Heraeus" fused quartz glass articles; silica ware; "Heraeus" resistance thermometers.)  
 Fiat Automobile Co., 1786 Broadway, N. Y. City. ("Fiat" gasoline pleasure cars & "Fiat" parts & supplies.)

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**IMPORTERS, Auto Goods—Continued**

- Flandrau Motor Car Co., 406-12 Broome St., N. Y. City. "Flandrau." (Gasoline pleasure cars.)
- Fraase, Peter & Co., 130-32 Worth St., N. Y. City. ("F. A. G." German steel balls & ball bearings, "Foldi" chrome nickel steel, high speed steel, alloy steel, carbon steels, auto springs & spring steel & tool steel tubing.)
- French Motor Import Co., 1777 Broadway, Room 216, N. Y. City. "Barre" & "Gregarre." (Gasoline pleasure cars.)
- Gary, Theo. H. Co., 50-52 Franklin St., N. Y. City. ("Grack-Unicum" electric horn attachment; porcelain tubes & "Isolit" insulation for spark plugs.)
- ★Gibney, J. L. & Bro., 215-17 N. Broad St., Phila., Pa.
- Greek-American Sponge Co., Franklin & Randolph Sts., Chicago, Ill. (Sponges & chamois.)
- ★Herz & Co., 203-205 Lafayette St., N. Y. City. (French coils, magnetos & French asbestos copper gaskets.)
- ★Hess-Bright Mfg. Co., The, 2102 Fairmount Ave., Phila., Pa. "Taurus" (magnetos.)
- Hoffnung, S. & Co., Ltd., 116 Broad St., N. Y. City. ("Coventry Wormroller" chains & "Fastnut" lock washers.)
- Holland Enamel & Paint Co., 142 Fulton St., N. Y. City. "Hepeco." (Paints and enamels.)
- Hol-Tan Co., The, 1741 Broadway, N. Y. City. "Lancia" (cars.)
- Hotchkiss Import Co., 20 W. 60th St., N. Y. City. "Hotchkiss." (Gasoline cars & spare parts.)
- International Engineering Co. of N. J., 1779 Broadway, N. Y. City. ("Lemoine" springs, forgings & axles & mango-silicon steel & "RBF" ball bearings.)
- Jenatzy Rubber Co., 36 W. 43rd St., N. Y. City. ("Jenatzy" tires & tubes.)
- Jones, B. M. & Co., Inc., 141 Milk St., Boston, Mass. ("Mushet" steels & "Taylor Best Yorkshire" iron & steel twist drills.)
- Keim Supply Co., 1227 Market St., Phila., Pa.
- Kent, Edwin R. & Co., 115 Adams St., Chicago, Ill. ("Kent's" tool steel.)
- Krefeld Steel Co., 50 Church St., N. Y. City. (Crankshafts, drop forgings & tool steel.)
- La Buire Import Co., 123 W. 68th St., N. Y. City. ("La Buire" cars & auto supplies.)
- Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. ("M. A. B." speed change gears, frames, axles, transmissions & steering apparatus; "Persan-Beaumont" auto springs, "Norma" ball bearings, "Montbard-Aulnoge" forgings of pistons, cylinders, axles, etc.)
- Leavitt, C. W. & Co., Cortlandt Bldg., 30 Church St., N. Y. City. (Ores, metals & alloys.)
- ★Lehman, J. H. Mfg. Co., 500 5th Ave., N. Y. City. ("Fulmina" magnetos & "B. K. F." ball bearings.)
- Leighton Auto Co., Brockton, Mass. "S. C. A. T." (Gasoline pleasure cars.)
- Lloyd, A. J. & Co., 323 Washington St., Boston, Mass. (Goggles & aneroid barometers.)
- Lounsbury, G. H. & Sons, 107-109 W. Third St., Cincinnati, Ohio. (Trimming leather, cushion & back springs, upholstery buttons & tacks, curled hair, imitation leather & top fabrics.)
- Machol, Morris R., 81 New St., N. Y. City. "Magnalium." (Aluminum alloy ingots, sheets, rod, wire & tubing.)
- Magnet Motor Co., 1400 Michigan Ave., Chicago, Ill. ("Magnet" motorcycles, marine engines & side cars; "F. R. L." lamps; "Shamrock" tires & rubber belts; leather belts.)
- ★Manufacturers' Supplies Co., 418 Arch St., Phila., Pa.
- Marburg, Theo. H., Room 12, 59 Wall St., N. Y. City. ("Mea" magnetos & "S. R. O." ball bearings.)
- ★Merchant & Evans Co., 517 Arch St., Phila., Pa. (Axles, chassis & special steels.)
- Miller, Chas. E., 97-101 Reade St., N. Y. City.
- Motor Car Equipment Co., The, 55 Warren St., N. Y. City. (Goggles, ammeters, voltmeters, English compound & triple pumps, "Pognon," "De Dion," & "A. V." magnetos, "Oleo" spark plugs, "Argus" dash mirrors & "Pirelli" cable.)
- Nash, Geo. Co., 217 Pearl St., N. Y. City. "Ultra Capital" (high speed cutting steels, tempered spring steels, cold rolled tool steel.)
- National Sales Corporation, 232 W. 58th St., N. Y. City. ("Peugeot" chains & "Pirelli" ignition cable.)
- Nilmelior Electrical Co., 1789 Broadway, N. Y. City. (Magnetos, timers, spark coils, switches, magnetic plugs, spark plugs, ignition cable, etc.)
- Otto, Albert T., Motor Mart, 1876 Broadway, N. Y. City. "Bertolet" (automobiles.)
- Panhard & Levassor, Broadway & 62nd St., N. Y. City. ("Panhard & Levassor" gasoline pleasure cars, chassis, marine motors, "Krebs" carburetors, "Phenix" shock absorbers & spare parts for Panhard chassis.)
- Phillips, F. R. & Sons Co., Penn Bldg., Phila., Pa. "Velos" (high speed tool steels & twist drills.)
- Pomeroy & Fischer, 28-30 Frankfort St., N. Y. City. (Paints & varnishes.)
- Quinby, J. M. & Co., 21-39 Division St., Newark, N. J. "Isotta." (Gasoline pleasure cars.)
- R. I. V. Co., 1771 Broadway, N. Y. City. "Hoffman." (Steel balls.)
- Renault Freres Selling Branch, 1776 Broadway, N. Y. City. "Renault." (Gasoline cars.)



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**BISHOP IGNITION CABLE**

The strongest and most durable cable on the market. Made especially to run under the most adverse conditions. All sizes—highest insulation—extreme flexibility.



A trial of our cable will prove that it saves money. Our customers claim that it is superior to the imported cable. Fully guaranteed.

Samples and prices to the trade upon application.

**HEAT, OIL AND WATER-PROOF**

**BISHOP GUTTA-PERCHA CO.**  
428 East 25th St., New York



**IMPORTERS, Auto Goods—Continued**

- Rex Tire Co., 133 W. 68th St., N. Y. City.  
 ("Pompe Vadam" mechanical tire inflators & tire inflating tanks, "Samson" auto pneumatic rubber tires & inner tubes, "Samson Type Course" & "Samson" Cape Noire" non-skidding auto pneumatic leather tires.)
- Rhodes, J. H. & Co., Chicago, Ill. (Rubbing stones.)
- Rogers, H. A. Co., 19 John St., N. Y. City. "Monerleff." (Gauge glasses.)
- S. P. O. Automobile Co., 1595 Broadway, N. Y. City. "S. P. O." (Cars, machinery, ball bearings, tools, etc.)
- Sanford, Wm. Co., 903 N. Broad St., Phila., Pa. ("Englebert" tires, made in Belgium, "Samson" tires, shoes & tubes, made in France, "Bosch" magnetos, parts & plugs & general line of accessories & novelties.)
- Silkman, Chas. R., 111 Duane St., N. Y. City. "Pluviusin" (imitation leather.)
- Simms Magneto Co., 1780 Broadway, N. Y. City. "Simms." (Magnetos.)
- Sultemeyer & Co., 50 Church St., N. Y. City. "Rhineland." (Ball bearings.)
- Thurston, F. W., Chicago, Ill. (Rubbing bricks, pumice stone, bronze powder & gum shellac.)
- Waddell, R. J. & Co., 52 Beekman St., N. Y. City. (Lump pumice stone.)
- Wende & Co., 350-52 Wabash Ave., Chicago, Ill. "Swiss-Komet." (Magnetos.)
- Wiese, Wm. & Co., 66-68 Greene St., N. Y. City. (Linings for autos.)
- Wolff, Alfred & Co., 45 Vesey St., N. Y. City. (Spark plugs, miniature & candleabra, carbon & Tungsten lamps for autos, electric flash lights, cigar lighters, novelties, etc.)

**IMPORTERS, Cycle & Motor Cycle Goods**

- Breakstone, S., 1712 Michigan Ave., Chicago, Ill. "Edco" (spark plugs, tire lugs, tire valves & lock nuts, motorcycle.)
- ★Hendee Mfg. Co., 837 State St., Springfield, Mass. "Brooks." (Motorcycle saddles.)
- Leng's, Jno. S. Sons & Co., 33 Murray St., N. Y. City. (Cycle.)
- ★Manufacturers' Supplies Co., 418 Arch St., Phila., Pa. (Also motorcycle.)
- Prospect Motor Co., 1900 Broadway, N. Y. City. ("Peugeot" & Buchet" cycle motors & "Allright" motorcycles.)
- Royal Motor Works Co., Worcester, Mass. ("Brown & Barlow" carburetors & "Watawata" V-belts.)

**INFLATORS, Mechanical Tire**

(See Tire Inflators, Mechanical.)

**INNER TIRE SHOES**

(See Tire Protectors.)

**INNER TUBES, Automobile**

- ★Ajax-Grieb Rubber Co., 1777 Broadway, N. Y. City.
- Atlas Rubber Co., Niagara & Massachusetts Aves., Buffalo, N. Y. "Atlas."
- Automobile Tire Co., Inc., 1625 Broadway, N. Y. City. "Bon Marche."
- Bradford Co., The, Delaware Ave. & Tatnall St., Wilmington, Del. "Bradford."
- Brameld Non-Collapsible Pneumatic Tire Co., 22 Hopper St., Paterson, N. J.
- Brown's Perfection Tube Co., 125 Watts St., N. Y. City. "Brown's."
- Cincinnati Rubber Tire Co., The, 522 Main St., Cincinnati, Ohio. "Cincinnati."
- Continental Rubber Works, Erie, Pa.
- Courtney Rubber Co., 1976 Broadway, N. Y. City. "Courtney."
- ★Diamond Rubber Co., Akron, O. "Diamond."
- Dow Tire Co., 2000 Broadway, N. Y. City. "Dow."
- ★Empire Tire Co., Trenton, N. J. "Empire."
- Federal Rubber Co., 126 Oneida St., Milwaukee, Wis.
- ★Firestone Tire & Rubber Co., Akron, O.
- ★Fisk Rubber Co., Chicopee Falls, Mass.
- ★G & J Tire Co., Indianapolis, Ind.
- ★Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear."
- Home Tire Co., Trenton, N. J. "Home."
- Jenatzy Rubber Co., 36 W. 43rd St., N. Y. City. (Imported.)
- Lee, J. Ellwood Co., Conshohocken, Pa. "Jelco."
- McGraw Tire & Rubber Co., Grant Blvd. & 33rd St., Pittsburgh, Pa. "Imperial."
- Mansfield Rubber Co., Mansfield, O. "Mansfield."
- ★Manufacturers' Supplies Co., 418 Arch St., Phila., Pa. "Velox."
- Mattson Rubber Co., Lodi, N. J.
- Michelin Tire Co., Milltown, N. J. "Michelin."
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M. & W."
- Newark Rubber Mfg. Co., Newark, N. J.
- Newmastic Tire Co., 151 W. 68th St., N. Y. City. "Newmastic." (Filled.)
- Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y. "P. S. & Co."
- Peerless Tire Co., 1610 Michigan Ave., Chicago, Ill.
- Preston Fabric Tire Co., 1400-1410 Niagara St., Buffalo, N. Y.
- Rex Tire Co., 138 W. 68th St., N. Y. City. "Samson." (Imported.)
- Rutherford Rubber Co., Rutherford, N. J. "Sterling."
- Seamless Rubber Co., New Haven, Conn. "Kantleek."
- Smith, C. J. & Co., St. Paul, Minn. "Cisco."
- Star Rubber Co., Akron, Ohio. "Star."
- ★Thermoid Rubber Co., Trenton, N. J. "Trenton Triangle T."
- Valveless Inner Tube Co., 43-49 Exchange Pl., N. Y. City. "Valveless."

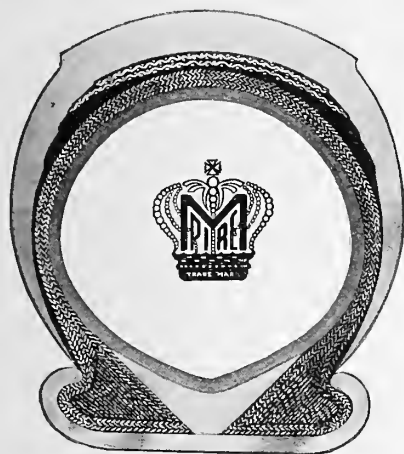
**INNER TUBES, Cycle & Motor Cycle**

- ★Ajax-Grieb Rubber Co., 1777 Broadway, N. Y. City.
- Continental Rubber Works, Erie, Pa.
- ★Diamond Rubber Co., Akron, Ohio. "Diamond."
- ★G & J Tire Co., Indianapolis, Ind.
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M. & W."

★ indicates Advertisers—see Index in back of book.

# *Empire Tires*

**WEAR LONGEST**



## *Empire Peerless*

**RED TUBES.**

*NO OTHER TUBES ARE QUITE SO GOOD*

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THIS COMBINATION HAS WON  
EVERY ENDURANCE CONTEST  
THAT THEY EVER ENTERED

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## EMPIRE TIRE CO.

TRENTON, N. J.

Branches and Agencies throughout United States  
and Canada

## INNER TUBE BAGS

- ★ Allen Auto Specialty Co., 1926 Broadway, N. Y. City. "Allen."
- ★ Empire Tire Co., Trenton, N. J. "Empire." (Tube cases & bags.)
- Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City. (Cases.)
- Gilbert Mfg. Co., New Haven, Conn. (Cases.)
- ★ Hopewell Bros., 29 Chapel St., Newton, Mass. "Hopewell." (Cases.)
- Murray, P. A. & Co., Newton, Mass. (Cases.)
- ★ Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."
- ★ Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, Ohio. "Gordon."
- ★ Winship, W. W., 71 Summer St., Boston, Mass.

## INSPECTION LAMPS

- American Ever Ready Co., 304-22 Hudson St., N. Y. City. "Eveready."
- American Enamel Co., Providence, R. I. "Bri-telite."
- Ampvo Battery Co., 1607 Michigan Ave., Chicago, Ill.
- ★ Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B & R."
- Benoist Bros. Mfg. Co., 3923 Olive St., St. Louis, Mo. "Black Jack."
- Brown Co., The, 1071-73 S. Clinton St., Syracuse, N. Y. "Brown" (portable wash-rack light.)
- Bunnell, J. H. & Co., 20 Park Pl., N. Y. City.
- Chase-Shawmut Co., Newburyport, Mass. "Shawmut."
- Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill. "Perretz."
- Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."
- Culver-Stearns Mfg. Co., 34 Southbridge St., Worcester, Mass. "C-S."
- Electric Motor & Equipment Co., 232 Market St., Newark, N. J. (Cord & socket.)
- Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "XLCR."
- Fenner, The A. W. Co., Providence, R. I.
- Flexible Valve Remover Co., 12 Beverly St., Providence, R. I. "White."
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Manhattan Electrical Supply Co., 17 Park Pl., N. Y. City. "Manhattan."
- Marcuson, E., 521 W. 182nd St., N. Y. City.
- "Witham." (Electric safety lights & Tungsten lamps.)
- Matchless Light Co., Caxton Bldg., Cleveland, O. "Match-less."
- Metal Specialties Mfg. Co., 427-441 W. Ran-

- dolph St., Chicago, Ill. "Presto." (Incandescent repair lamps.)
- ★ Morse, Frank W., 516 Atlantic Ave., Boston, Mass. "Morse." (Auto & Marine.)
- National Carbon Co., Lock Drawer L, Cleveland, O. "Columbia."
- New Idea Sales Co., Corning, N. Y. "New Idea."
- Ohio Electric Works, 6304 Ellen Ave., N. W., Cleveland, Ohio. "Ohio."
- Penn Auto Supply Co., N. E., cor. Broad & Race Sts., Phila., Pa. "Christman."
- Rollman Mfg. Co., Mount Joy, Pa. "Klip."
- Shain, Chas. D., 70 Murray St., N. Y. City. "Shain's."
- Smith, I. J. Mfg. Co., Inc., 4283 Park Ave., N. Y. City. "Aladdin." (Portable electric light stand.)
- Standard Sheet Metal Co., Delaware Ave., Passaic, N. J. "Rayflex."
- Stanley & Patterson, 23 Murray St., N. Y. City. "Matchless."
- ★ Union Battery Co., Belleville, N. J. "Union."
- Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill.
- Williams, E. Q., 537 S. Clinton St., Syracuse, N. Y.
- Witherbee Igniter Co., 1876 Broadway, N. Y. City. "Wico."
- Wolff, Alfred & Co., 45 Vesey St., N. Y. City. (Imported.)

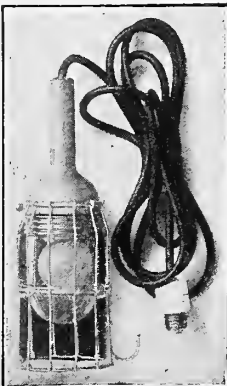
## INSTRUCTION, Auto

(See Schools.)

## INSULATING TAPE

- Clifton Mfg. Co., Boston, Mass.
- Dunton, The, M. W. Co., Providence, R. I. "Black Diamond." (Friction.)
- ★ Johns-Manville, H. W. Co., 100 William St., N. Y. City.
- Kerite Insulated Wire & Cable Co., 30 Church St., N. Y. City.
- Mattson Rubber Co., Lodi, N. J.
- New York Insulated Wire Co., 114 Liberty St., N. Y. City. "Grimshaw," "Competition" & "Raven Brand." (Friction & rubber.)

Can be Attached to Plug Receptacle



### "MORSE"

No. 26 Vapor-Proof Hand Lamps  
For Garages, etc.

No. 27 For Automobiles  
and Power Boats

Are the Only Practical Ones on the Market for they are the only ones that allow the free use of both hands, and have a switch to prevent waste of battery.

For sale by all Electric and Automobile Supply Houses.  
Write for Illustrated Price-List.

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**FRANK W. MORSE**

514-516 Atlantic Avenue  
BOSTON, MASS.

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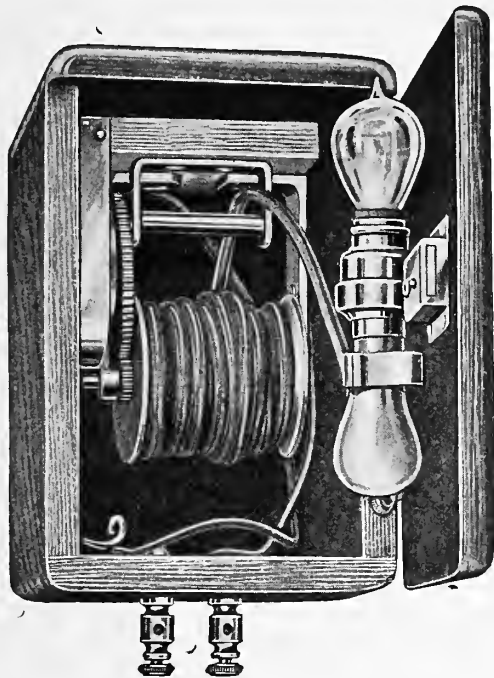


# "Light on the Trouble Question"

## CHRISTMAN

### ADJUSTABLE DASH LIGHT

"Trouble  
Hunting"  
by  
Night  
on  
Any Part  
of  
Your  
Car  
Made Easy



Open the  
Box, uncoil  
the wire  
—and go to  
the Heart  
of the  
machine  
with an  
Electric  
Glare

The Christman Adjustable Dash Lamp is a 6 x 4-inch walnut finish box attached to the dash of the car, and connected with the storage battery or dry cell battery for its current. It "lights" automatically, when the box door is opened, releasing the light bulb, which has a 10-foot coil, allowing the lamp to be moved to any part of the car. Broken globes or smashed lamps (so common to the tool box variety of lamp) are impossible. It is the lamp that's always with you and always ready for use—and always in the same place in time of trouble.

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## Penn Auto Supply Co., Phila., Pa., U.S.A.

BRANCHES { 139 W. 4th St., Williamsport, Pa.  
2006 Pacific Ave., Atlantic City, N. J.  
1407 Filbert St., Phila., Pa.

Headquarters  
236 N. BROAD STREET

*Retailers, Jobbers, Manufacturers*

Anything in AUTOMOBILE ACCESSORIES or  
GENERAL MECHANICAL SUPPLIES of Any  
Kind. We Can Furnish or Tell You Where to Get it  
SPECIFY YOUR WANTS WE SUPPLY THEM

**INSULATING TAPE—Continued**

- Okonite Co., The, 253 Broadway, N. Y. City.  
 "Okonite." (Rubber.)  
 ★Packard Electric Co., The, Warren, Ohio.  
 "Packard."  
 Standard Underground Cable Co., Pittsburg,  
 Pa.  
 Walpole Rubber Works, Walpole, Mass.

**INSULATION**

- Adams, S. E. & Co., 114 Bowers St., Jersey  
 City Heights, N. J. (Mica tubes for spark  
 plugs.)  
 American Lava Co., Chattanooga, Tenn. "La-  
 va."  
 American Mica Co., Newton Lower Falls,  
 Mass. (Mica.)  
 American Vulcanized Fibre Co., 500 Equitable  
 Bldg., Wilmington, Del.  
 Artistic Porcelain Co., Trenton, N. J. (Porce-  
 lain.)  
 Asheville Mica Co., Asheville, N. C. (Mica.)  
 ★Auto Specialties Mfg. Co., 656-658 3rd St.,  
 Milwaukee, Wis. "Simplex." (Mica cores.)  
 Boston Insulated Wire & Cable Co., 182-186  
 Freeport St., Boston, Mass.  
 Brunt, G. F. Porcelain Co., S. Market St., E.  
 Liverpool, Ohio. (Porcelain.)  
 Chicago Mica Co., Valparaiso, Ind. "Mica-  
 bond." (Mica.)  
 Continental Fibre Co., Newark, Del. (Fibre.)  
 Crescent Burner Mfg. Co., 339 Broadway, N.  
 Y. City. "Crescent."  
 Diamond Porcelain Co., Chauncey St., Tren-  
 ton, N. J. "Diamond." (Porcelain.)  
 Dickinson Mfg. Co., Foot of Mechanic St.,  
 Springfield, Mass.  
 Dunton, The M. W. Co., Providence, R. I.  
 (Red rope insulating paper.)  
 Electroze Mfg. Co., 127 N. 10th St., Brooklyn,  
 N. Y. "Electroze."  
 Gary, Theo. H. Co., 50-52 Franklin St., N. Y.  
 City. "Isolit." (Imported.)  
 General Insulate & Machine Co., 1008-14 At-  
 lantic Ave., Brooklyn, N. Y. (Insulations,  
 switch bases, knobs & handles, cable  
 sockets, bushings, coil box tops, timer  
 boxes, cable-end sockets & battery insula-  
 tions.)  
 ★Imperial Porcelain Works, Trenton, N. J.  
 "Imperial." (Porcelain tubes.)  
 ★Jeffery-Dewitt Co., 217-219 High St., Newark,  
 N. J. (Spark plug porcelains.)  
 Massachusetts Chemical Co., Walpole, Mass.  
 ("Armalac" insulating shellac; "Hi-Ten-  
 sion" hard rubber & hard rubber bush-  
 ings.)  
 Mica Core Mfg. Co., 442 E. 166th St., N. Y.  
 City. (Mica cores for spark plugs.)  
 Mica Insulator Co., 68 Church St., N. Y. City.  
 (Mica & mica tubes.)  
 Mica Mfg. Co., 307 West Broadway, N. Y.  
 City. "Micasmith's." (Mica cores, plates,  
 bushings, segments, tubes, rings, washers,  
 cut & uncut mica, etc.)  
 National Fibre Insulation Co., Yorklyn, Del.  
 (Hard fibre insulating paper.)  
 National Porcelain Co., Rose & N. Feeder  
 Sts., Trenton, N. J. (Porcelain.)  
 New York Mica Mfg. Co., 122 Clark St.,  
 Auburn, N. Y. (Mica.)  
 ★O. K. Mica Core Co., 23 Fulton St., Brook-  
 lyn, N. Y. "Conqueror," "Conqueror, Jr."  
 "Mammoth," "Torpedo" & "Vulcano."  
 (Mica tubes.)  
 Pass & Seymour, Inc., Solvay, N. Y. (Porce-  
 lain.)  
 Peru Electric Mfg. Co., Peru, Ind. (Porce-  
 lain for spark plugs & porcelain cups for  
 spark coils.)  
 ★Rajah Auto Supply Co., Bloomfield, N. J.  
 "Rajah." (Porcelain.)  
 Royal Fibre Co., West Somerville, Mass.  
 (Hard fibre.)

- Schoonmaker, A. O., 221 Fulton St., N. Y.  
 City. (Mica insulating tubes & washers.)  
 Standard Fibre Co., Somerville, Mass. (Hard  
 fibre.)  
 Standard Varnish Works, 29 Broadway, N. Y.  
 City. (Insulating varnish & compounds.)  
 ★Star Porcelain Co., Trenton, N. J. (Porce-  
 lain.)  
 U. S. Indestructible Gasket Co., 50 Church St.,  
 N. Y. City. (Mica washers.)  
 Vance, D. T., Plumtree, N. C. "North Caro-  
 lina." (Mica.)  
 Western Electric Co., The, 465 West St., N.  
 Y. City. (Wire.)  
 Wilmington Fibre Specialty Co., Wilmington,  
 Del. (Fibre sheets, rods, tubes & cleats,  
 & "Fyberoid" insulating paper.)

**INSURANCE**

- American Fidelity Co., Montpelier, Vt.  
 Auto-Underwriters' Asso., The, Montague St.,  
 Brooklyn, N. Y. (Auto.)  
 Automobile Mutual Insurance Co. of Ameri-  
 ca, Banigan Bldg., Providence, R. I.  
 Corn, Paul J., Inc., 225 5th Ave., N. Y. City.  
 Empire State Surety Co., 84 William St., N.  
 Y. City.  
 Employers' Liability Assurance Corporation,  
 Boston, Mass.  
 General Accident Fire & Life Assurance Corp.,  
 Ltd., of Perth, Scotland, 400 Walnut St.,  
 Phila., Pa. (Auto.)  
 German Commercial Accident Co., 1011 Chest-  
 nut St., Phila., Pa.  
 Insurance Co. of North America, 232 Walnut  
 St., Phila., Pa. (Motor boat.)  
 McNear & Wilbur, 34 Pine St., N. Y. City.  
 (Auto & motor boat.)  
 Motor Boat Insurance General Agency, St.  
 Joseph, Mich. (Marine.)  
 Philadelphia Casualty Co., North Broad St.,  
 Phila., Pa. (Auto, motor cycle & motor  
 boat.)  
 Sears, E. H., 31A Harvard St., Brookline,  
 Mass. (Auto & marine.)  
 Standard Accident Insurance Co., The, De-  
 troit, Mich. (Auto.)

**INTAKE MANIFOLDS**

(See Manifolds &amp; Piping.)

**INTENSIFIERS, Spark**

(See Spark Gaps.)

**INTERIOR LIGHTS, Limousine**

(See Dome Lights.)

**IRON CASTINGS, Grey**

(See Castings, Grey Iron.)

## IRON CEMENT

(See Cements, Metal.)

## IRONS, Body & Top

(See "Body Irons" & "Top Irons.")

## JACKS

(See also Car Supports for Garages.)

- A. B. C. Jack Co., 14 Columbus Ave., Boston, Mass. "A. B. C."
- Auburn Auto-Pump Co., 1 Mason Lane, Auburn, N. Y. (Pneumatic.)
- ★Auto & Accessories Mfg. Co., 1416 Madison Ave., Baltimore, Md. "Norwood." (And casters combined.)
- Barth Mfg. Co., 348 Milwaukee St., Milwaukee, Wis. "Barth."
- ★Batavia Clamp Co., 103 Center St., Batavia, N. Y. "Colts."
- Beckert, Wm., 1005 E. Ohio St., Allegheny, Pa. (Combined jack and truck.)
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Baby National" & "Booster."
- Bicycle Step Ladder Co., 65 Randolph St., Chicago, Ill. "Murray."
- Binsse Machine Co., The, Newark, N. J. (Levelling planer.)
- Blevney, John C., 216-224 High St., Newark, N. J. "Royal."
- ★Buckeye Jack Mfg. Co., Alliance, O. "Buckeye."
- Buda Co., The, Chicago, Ill. "Buda."
- Buffington & Co., H. A., Berkshire, N. Y.
- Central Brass & Fixture Co., The, Springfield, O.
- Chicago Pneumatic Tool Co., Chicago, Ill. (Afr.)
- Conover, E. K., 675 E. 23rd St., Paterson, N. J. "Conover."
- Cook's Standard Tool Co., Kalamazoo, Mich. "Standard."
- Covert's Saddlery Works, Interlaken, N. Y. "Quick-Lift."
- Duff Mfg. Co., Westinghouse Bldg., Pittsburg, Pa. "Barrett" & "Barret Junior."
- ★Elite Mfg. Co., Ashland, Ohio. "Reliable," "Ideal" & "Ohio."
- Elmes, Chas. F. Engineering Works, corner Morgan & Fulton Sts., Chicago, Ill. (Hydraulic.)
- ★Empire Jack Co., The, 11-15 Dill St., Auburn, N. Y. "Empire."
- Eureka Mower Co., Utica, N. Y. (Lifting.)
- Haslup Motor Jack Co., Sidney, Ohio. "Haslup."
- Joyce-Cridland Co., Dayton, Ohio. "XX Century."
- Kenney Mfg. Co., New London, Conn. "Kenney."
- Klemm, E. R., 616 Monroe St., Chicago, Ill.
- Lane Brothers Co., Poughkeepsie, N. Y. "Lane."
- Miller, Chas. E., 97-101 Reade St., N. Y. City. "Miller."
- Moore, J. C. & Co., Racine, Wis. "Moore's."
- Morse, J. E., Springfield, Vt. "Morse."
- Motor Car Equipment Co., 55 Warren St., N. Y.
- National Jack & Mfg. Co., 132-34 S. Clinton St., Chicago, Ill. "National" & "Alrite."
- ★Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.
- Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich. (Pneumatic.)

- ★Oliver Mfg. Co., 326 S. Desplaines St., Chicago, Ill. "Peerless," "New Samson" & "Oliver's E-Z."
- Orange Machine & Mfg. Co., The, 10-14 Stetson St., Orange, N. J. "Orange."
- Osborne Pole & Shaft Co., Anderson, Ind. "Handy."
- Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson."
- Pratt, Wm. E., Mfg. Co., 91 Lake St., Chicago, Ill. "Perfect," "Chicago" & "Automatic Trip."
- Shawver Co., The, Springfield, O. "Springfield."
- Somers, Fittler & Todd Co., 327 Water St., Pittsburg, Pa.
- Spitzll Mfg. Co., 6-14 Devereaux St., Utica, N. Y. "Spitzll."
- Stickney, Charles A., St. Paul, Minn. "Stickney." (Worm gear pump.)
- Temple Pump Co., The, 17-27 W. 15th St., Chicago, Ill. (Pump.)
- Union Elevator & Machine Co., 215-17 Ontario St., Chicago, Ill. "Union."
- U. S. Jack Co., 644 W. Lake St., Chicago, Ill. "U. S." & "Atlas."
- Vanderpool Bros., Springfield, Ohio. "Van."

## JARS, Rubber Battery

(See Battery Jars.)

## COLT'S AUTOMOBILE

# JACK



¶ A new form of U-shaped dog brings leverage and support close to the bar, securing unequalled power for raising and lowering the load.

¶ This jack is double acting, raising the load with both upward and downward movement of lever. Height with bar down, 11 inches. Raise of bar, 6 inches. Capacity, one ton.

**Price, \$3.50**

LIBERAL DISCOUNT TO DEALERS  
ASK FOR CATALOG No. 157

## BATAVIA CLAMP CO.

103 CENTER STREET :: BATAVIA, N. Y.

**JOBBERs, Auto Parts, Accessories and Supplies**

- Akron Auto Supply Co., 390 S. Main St., Akron, Ohio.
- Albaugh-Dover Co., Marshall Blvd. & 21st St., Chicago, Ill.
- Alexander-Sewald Co., Atlanta, Ga.
- Alexander, W. H. Cycle Co., Spokane, Wash.
- American Auto Supply Co., 88 Chambers St., N. Y. City.
- Angier Co., The, 737 Boylston St., Boston, Mass.
- Archer, Combs & Co., 306 Oak St., Portland, Oregon.
- ★Auto & Accessories Mfg. Co., 1416 Madison Ave., Baltimore, Md. (Oils, polish, tools & accessories.)
- Auto & Aeronautic Supply Co., 2100 Broadway, N. Y. City.
- Auto Equipment Co., 144-146 N. Broad St., Phila., Pa.
- ★Automobile Equipment Co., The, 260 Jefferson Ave., Detroit, Mich.
- Automobile Supply Co., The, 1339 Michigan Blvd., Chicago, Ill.
- Automobile Supply Co., 1326 Vine St., Phila., Pa.
- Automobile Tire Co., Inc., 1625 Broadway, N. Y. City. (Auto tires.)
- Auto Parts Co., 517-23 W. Jackson St., Chicago, Ill.
- Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.
- Auto Purchasing & Exchange Co., Inc., The, 211 High Ave., Cleveland, O.
- Auto Supply Co., Inc., 1733-37 Broadway, N. Y. City. (Parts, supplies, tools & clothing.)
- Baker, W. E. & Co., 1779 Broadway, N. Y. City.
- Baker, F. A. & Co., 37 Warren St., N. Y. City.
- Ball-Flintze Co., Newark, O.
- Ballou & Wright, Portland, Ore.
- Barrett, M. L. & Co., 219 Lake St., Chicago, Ill. (Glycerine & talc.)
- Baum Iron Co., The, (Auto Supply Dept.), 1216 Harney St., Omaha, Neb.
- Becker & Wickser Co., 9 & 11 Court St., Buffalo, N. Y.
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- Beckwith Box Tool Co., 130-32 Lincoln St., Boston, Mass. (Duck backed linoleum.)
- Behen-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.
- Bennett Auto Supply Co., The, 315 Nebraska St., Sioux City, Ia.
- Benton & Son, Thos. P., La Crosse, Wis.
- Bill, John T. & Co., Los Angeles, Cal.
- Bi-Motor Equipment Co., 177 Portland St., Boston, Mass.
- Bittenbender Co., The, Scranton, Pa. (Trim-mings, tops, wheels & body makers' supplies.)
- ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo. (Parts.)
- Boston Cycle & Sundry Co., 48 Hanover St., Boston, Mass.
- Brown-Dewey Co., 1697 Broadway, N. Y. City.
- Browning Bros., Ogden, Utah.
- Brunner, H. J. Hardware Co., Kansas City, Mo.
- Carr, F. S. Co., 113 Purchase St., Boston, Mass. (Curtain fasteners.)
- Central City Rubber Co., Hanover Square, Syracuse, N. Y.
- Chandler & Farquhar Co., 34-38 Federal St., Boston, Mass.
- Channon, H. Co., Market & Randolph Sts., Chicago, Ill. (Machinery.)
- Chanslor & Lyon Motor Supply Co., 501-07 Golden Gate Ave., San Francisco, Cal.
- Cincinnati Automobile Co., The, 908-12 Race St., Cincinnati, O.
- Cisler & Serson, 3111 Michigan Ave., Chicago, Ill.
- Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, Ohio. (Hose.)
- Coggins & Owens, Baltimore, Md.
- Collister & Sayle, Cleveland, O.
- Columbia Auto Top Co., 17 Dwight St., Springfield, Mass.
- ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. (Trim-mings, steps & body material.)
- Cray Bros., 1111-1115 West 11th St., Cleveland, Ohio.
- Crescent Tire Co., The, 14 Thoroughfare Bldg., N. Y. City. (Automobile tires & supplies.)
- Crosby, S. L. Co., Bangor, Me.
- Day, E. J. & Co., Oakland, Cal.
- Dolson Auto Supply Co., Muncie, Ind.
- Economy Cycle Supply Co., Detroit, Mich.
- Electric Mfg. Co., 355 Minnesota St., St. Paul, Minn.
- Elyea, Austell Co., Atlanta, Ga.
- Empire Auto Supply Co., 277 Halsey St., Newark, N. J.
- Empire Auto Supply Co., 1904 Broadway, N. Y. City.
- Enterprise Machine Co., 1114-22 S. Third St., Minneapolis, Minn. (Carburetors, magnets and jump spark plugs.)
- ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- Excelsior Tire Co., 1777 Broadway, N. Y. City.
- Farwell, Ogmum, Kirk & Co., St. Paul, Minn.
- Fenstermacher, O., 311 S. Fifth St., Minneapolis, Minn.
- Fidelity Oil Co., 600-02 W. 6th St., Kansas City, Mo. "Supreme," "Special," "Ideal" & "Eureka."
- Foote, D. E., Rubber Co., 1837 Euclid Ave., Cleveland, O.
- ★Ford, Percy Co., 226-228 Columbus Ave., Boston, Mass.
- Franco-American Auto & Supply Co., 1404-06 Michigan Ave., Chicago, Ill. (Ignition batteries and pumps.)
- French, Howard A. & Co., Baltimore, Md.
- Frey, Jno. W., 722 Main St., Buffalo, N. Y. (Ignition storage batteries.)
- General Automobile Supply Co., 1671-73 Broadway, N. Y. City.
- ★Gibney, J. L. & Bro., 215-17 N. Broad St., Phila., Pa.
- Gibson Automobile Co., 238 Massachusetts Ave., Indianapolis, Ind.
- Globe Metal Co., 401 W. Ontario St., Chicago, Ill. (Ignit copper, pig tin, lead & aluminum, zinc, solder, silicon, nickel, mercury, crucibles, etc.)
- Goodby, Albert E., 57 Washington St., Providence, R. I.
- Guarantee Tire & Rubber Co., 208-210 S. Illinois St., Indianapolis, Ind. (Tires and metal polish.)
- Hammer & Hull, 1837-39 Euclid Ave., Cleveland, O. (Storage batteries & electrical accessories.)
- Harvey, Arthur C. Co., 374 Congress St., Boston, Mass. (Bar & sheet iron, steel, etc.)
- Hearsey-Willis Co., Indianapolis, Ind.
- Hibbard, Spencer, Bartlett & Co., Chicago, Ill.
- Hobbie Automobile Co., Hampton, Ia.
- Holcomb Co., 105 Goffe St., New Haven, Conn.
- Horton, Henry, 422 State St., New Haven, Conn.
- Indianapolis Auto Top & Rubber Co., Indianapolis, Ind. (Wind shields & rubber tires.)
- Janney, Semple, Hill & Co., Minneapolis, Minn.
- Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.
- Jennison Hardware Co., The, Bay City, Mich.
- Johnson's, Iver, Sporting Goods Co., 155 Washington St., Boston, Mass.
- Kansas City Automobile Supply Co., 1504 Grand Ave., Kansas City, Mo.
- Kasner, A. H., 152 Church St., N. Y. City. (Tires.)
- Keim Supply Co., 1227 Market St., Phila., Pa.
- La Buire Import Co., 123 W. 68th St., N. Y. City.

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## WYETH SHIELD BRAND

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**JOBBER, Auto Parts, Accessories and Supplies—Continued**

- Leng's, John S. & Co., 33 Murray St., N. Y. City.
- McIntyre, Magee & Browne Co., 723 Sansom St., Phila., Pa. (Jobbers of goggles.)
- ★Manufacturers' Supplies Co., 418 Arch St., Phila., Pa.
- Marshall Oil Co., Marshalltown, Iowa. (Auto cylinder oil.)
- Matador Tire & Vulcanizer Co., 1400 Michigan Ave., Chicago, Ill.
- Mayo, James, 222 Penn St., Reading, Pa.
- Miller, Chas E., 97-101 Reade St., N. Y. City.
- Moore Motor Supply Co., Golden Gate & Van Ness Aves., San Francisco, Cal.
- ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I.
- Mossman, Yarnelle & Co., Fort Wayne, Ind. (Upholstery materials & trimmings.)
- Motor Car Equipment Co., 55 Warren St., N. Y. City.
- ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill.
- ★Motor Supply Co., The, Sumter, S. C.
- Mutual Auto Accessories Co., The, 1937 Broadway, N. Y. City.
- National Hardware Co., 327-29 W. Fourth St., Cincinnati, O. (Hardware.)
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- New Amsterdam Motor Co., 152 W. 56th St., N. Y. City. (Carbide.)
- N. Y. & Brooklyn Supply Co., 1717 Broadway, N. Y. City.
- ★N. Y. Sporting Goods Co., 15-17 Warren St., N. Y. City.
- Nock, Geo. W. Co., 126 N. 4th St., Phila., Pa.
- Norfolk Motor Co., Wollaston, Mass.
- Norris, R. Milton, 516-518 W. Baltimore St., Baltimore, Md.
- Norris, R. W. & Sons, 346-48 N. Gay St., Baltimore, Md. (Trimming, top materials & top bows.)
- ★Nyberg Auto Co., 2437-39 Michigan Ave., Chicago, Ill.
- O'Gorman, Younie Co., Inc., Portland, Ore.
- Olmsted, H. R. & Son, Syracuse, N. Y.
- Parker, J. P. & Co., Memphis, Tenn.
- Farnelee, S. S. Company, Macon, Ga.
- Pence Automobile Co., 717-19 Hennepin Ave., Minneapolis, Minn.
- ★Penn Auto Supply Co., N. E. Cor. Broad & Race Sts., Phila., Pa.
- Petoskey Boat Co., 115 Midway, Petoskey, Mich. (Supplies.)
- Pettingell-Andrews Co., 156-160 Pearl St., Boston, Mass.
- Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill. (Gasoline motor fittings.)
- Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo.
- Post & Lester Co., 20 Sargeant St., Hartford, Conn.
- Pruden, W. E. Hardware Co., 260 W. 52nd St., N. Y. City. (Hardware, lubricants, etc.)
- Puritan Mfg. Co., Milwaukee, Wis.
- Red Bank Garage Co., 30-32 W. Front St., Red Bank, N. J.
- Reineking, El., 388 Crescent St., Brooklyn, N. Y.
- ★Rice & Dayton Mfg. Co., Cedar Falls, Ia.
- Roby, Sidney B. Co., 208 South Ave., Rochester, N. Y.
- Rochester Rubber Co., Rochester, N. Y.
- Salt Lake Hardware Co., Salt Lake City, Utah.
- Seidler-Miner Supply Co., 207-211 Jefferson Ave., Detroit, Mich.
- Shain, Chas. D., 70 Murray St., New York City.
- Smith, Chas. S. & Co., 302 N. Broad St., Phila., Pa.
- Standard Automobile Supply Co., 1428 Michigan Ave., Chicago, Ill.
- Standard Tire & Rubber Co., 102 Portland St., Boston, Mass.

- Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.
- Strauss, Mathew, 707 Main St., Buffalo, N. Y.
- Strauss, Jos. & Son, 215-17 Genesee St., Buffalo, N. Y.
- Stryker, C. W., 314 E. Onondaga St., Syracuse, N. Y.
- Stuart, John Co., Wollaston, Mass.
- Stuart-Howland Co., Boston, Mass. (Electrical goods of all kinds.)
- Syracuse Rubber Co., 212-214 S. Clinton St., Syracuse, N. Y.
- Taylor, H. D. Co., 101-105 Oak St., Buffalo, N. Y. (Trimmings.)
- Ten Eick, Cornelius, 253 W. 47th St., N. Y. City.
- 35% Automobile Supply Co., 97 Chambers St., N. Y. City.
- Thompson, John H. & Co., 327 Jefferson Ave., Detroit, Mich.
- Truscott Boat & Auto Supply Co., St. Joseph, Mich.
- Union Supply Co., Toledo, O.
- Universal Auto & Motor Boat Supply Co., 113 Chambers St., New York City.
- Utica Cycle Co., 115-119 Columbia St., Utica, N. Y.
- Waite Auto Supply Co., 17 Dorrance St., Providence, R. I.
- Wells, Prince, 718-20 Fourth St., Louisville, Ky.
- Westchester Appliance Co., 13-15 Canal Place, Bronx Borough, N. Y. City.
- Wilkinson, A. J. & Co., 180-88 Washington St., Boston, Mass.
- Williams, C. L., 312 Halsey St., Newark, N. J.
- Williams, E. Q., 537 S. Clinton St., Syracuse, N. Y. (Cable, connectors, terminals & batteries.)
- Wilson's Sons, W. M., 225 Dock St., Phila., Pa. (Gasoline storage tanks.)
- Wilson Trading Co., The, 46 Cortlandt St., N. Y. City.
- Wimmer, J. H. Supply Co., 29 Washington Ave., Detroit, Mich.
- Wing, Chas. Co., The, Amesbury, Mass. (Trimmings, steps, springs & body material.)
- Woodwell, Jos. Co., Cor. Wood St. & 2nd Ave., Pittsburg, Pa. (Supplies.)
- ★Wyeth Hardware & Mfg. Co., St. Joseph, Mich.
- Zenith Motor Goods Co., 1841 Euclid Ave., Cleveland, O.

**JOBBER, Boat Materials**

- Andrews, W. D., Syracuse, N. Y.
- Bailey, James Co., The, 18 Free St., Portland, Me.
- Ballou & Wright, Portland, Ore.
- Bowler, Holmes & Hecker Co., 141 Liberty St., N. Y. City. (Marine engines, parts & motor boat hulls.)
- Brown-Dewey Co., 1697 Broadway, N. Y. City.
- Cape Cod Power Dory Company, Wareham, Mass. (Mooring anchors.)
- Cincinnati Automobile Co., The, 908-12 Race St., Cincinnati, O.
- Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, O. (Hose.)
- Day, E. J. & Co., Oakland, Cal.
- Durkee, C. D. & Co., Inc., 2 South St., N. Y. City.

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## Square

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Enterprise Machine Co., 1114-22 S. Third St., Minneapolis, Minn. (Hulls & boat trimmings.)  
 Fogg, M. W., 202 Front St., N. Y. City. (Chairs.)  
 ★Ford, Percy Co., 226-228 Columbus Ave., Boston, Mass.  
 French, Howard A. & Co., Baltimore, Md.  
 Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo.  
 Goshen Motor Works, Goshen, Ind. (Boats & supplies.)  
 Hammer & Hull, 1837-39 Euclid Ave., Cleveland, O. (Storage batteries & electrical accessories.)  
 Hopkins, Jno. C. & Co., 119 Chambers St., N. Y. City.  
 Jacobsen, Chas. M., 52 Woodward Ave., Detroit, Mich.  
 Jennison Hardware Co., The, Bay City, Mich.  
 Kaufmann, Chas., 28 Main St., Oshkosh, Wis.  
 Miller, Chas. E., 97-101 Reade St., N. Y. City.  
 Morley Bros., Saginaw, Mich.  
 Morley-Murphy Hardware Co., Green Bay, Wis.  
 Morss, A. S. Co., 210-12 Commercial St., Boston, Mass.  
 Norfolk Motor Co., Wollaston, Mass.  
 Petoskey Boat Co., 115 Midway, Petoskey, Mich.  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo.  
 Red Bank Garage Co., 30-32 W. Front St., Red Bank, N. J.  
 Salt Lake Hardware Co., Salt Lake City, Utah.  
 Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City.  
 Seldler-Miner Supply Co., 207-211 Jefferson Ave., Detroit, Mich.  
 Smilh, Chas. S. & Co., 302 N. Broad St., Phila., Pa.  
 Squires, Henry C. Sons, Squires Bldg., 44 Cortlandt St., N. Y. City.  
 Strauss, Jos. & Son, 215-17 Genesee St., Buffalo, N. Y.  
 Syracuse Rubber Co., 212-214 S. Clinton St., Syracuse, N. Y.  
 Truscott Boat & Auto Supply Co., St. Joseph, Mich.  
 Universal Auto & Motor Boat Supply Co., 113 Chambers St., N. Y. City.  
 Williams, C. L., 312 Halsey St., Newark, N. J.  
 Williams, E. A., Minneapolis, Minn.

**JOBBERs, Cycle Parts and Sundries**

Alexander-Sewald Co., Atlanta, Ga.  
 Alexander, W. H. Cycle Co., Spokane, Wash.  
 Andrews, W. D., Syracuse, N. Y.  
 Appeal Mfg. & Jobbing Co., Los Angeles, Cal.  
 Arnold, Schwin & Co., 1718-32 N. 43rd St., Chicago, Ill. (Wheels.)  
 Bailey, James Co., The, 18 Free St., Portland Me.  
 Baker & Hamilton, San Francisco, Cal.  
 Baker, F. A. & Co., 37 Warren St., N. Y. City.  
 Ball Pintze Co., Newark, O.  
 Ballou & Wright, Portland, Ore.  
 Bean Sons Co., San Jose, Cal.  
 Beard, Campbell & Co., Port Huron, Mich.  
 Berrick, John B. & Co., Manchester, N. H.  
 Bill, John T. & Co., Los Angeles, Cal.  
 BI-Motor Equipment Co., 1777 Portland St., Boston, Mass.  
 Blinley Hardware Co., Pittsburg, Pa.  
 Bigelow & Dowse, Boston, Mass.  
 Blish, Mize & Silliman Hardware Co., Atchison, Kan.  
 Boetticher & Kellogg Co., Evansville, Ind.  
 Boston Cycle & Sundry Co., 48 Hanover St., Boston, Mass.

Brecher, E. A. & Co., New York, N. Y.  
 Broadway Bicycle & Auto Supply Co., 60 Vesey St., N. Y. City.  
 Brown-Dewey Co., 1697 Broadway, N. Y. City.  
 Browning Bros., Ogden, Utah.  
 Brunner, H. J. Hardware Co., Kansas City, Mo.  
 Bumiller-Remelin Co., Cincinnati, O.  
 Central City Rubber Co., Hanover Square, Syracuse, N. Y.  
 Coggins & Owens, Baltimore, Md.  
 Collister & Sayle, Cleveland, O.  
 Columbus Sporting Goods Co., Columbus, O.  
 Crosby, S. L. Co., Bangor, Me.  
 Cunningham, John A., Jacksonville, Fla.  
 Davis, Hunt & Collister Co., Cleveland, O.  
 Economy Cycle Supply Co., Detroit, Mich.  
 Elyea, Austell Co., Atlanta, Ga.  
 ★Excelsior Supply Co., 233-37 Randolph St., Chicago, Ill.  
 Farwell, Ogmum, Kirk & Co., St. Paul, Minn.  
 Fletcher Hardware Co., Detroit, Mich.  
 Fobes Supply Co., Seattle, Wash.  
 Foote, D. E. Rubber Co., 1837 Euclid Ave., Cleveland, O.  
 Foss, M. L., 1729 California St., Denver, Colo.  
 Frankfurth, Wm. Hardware Co., Milwaukee, Wis.  
 French, Howard A. & Co., Baltimore, Md. (Cycle & motorcycle goods.)  
 Fry, Keyser, 723-25 Chestnut St., Reading, Pa.  
 Goodby, Albert E., 57 Washington St., Providence, R. I.  
 Grady, J. W. & Co., 68 High St., Worcester, Mass.  
 Hackett, Walther, Gates Hardware Co., Fourth & Rosabee Sts., St. Paul, Minn.  
 Harsey-Willis Co., Indianapolis, Ind.  
 Hibbard, Spencer, Bartlett & Co., Chicago, Ill.  
 Hoegee, W. H. & Co., Los Angeles, Cal.  
 Hofhelz, R. H., San Antonio, Texas.  
 Horton, Henry, 422 State St., New Haven, Conn.  
 Howlett, Frank C., Rochester, N. Y.  
 Janney, Semple, Hill & Co., Minneapolis, Minn.  
 Jarvis, W. B. & Co., Grand Rapids, Mich.  
 Johnson's, Iver, Sporting Goods Co., 163 Washington St., Boston, Mass.  
 Johnson-Weaks Co., Memphis, Tenn.  
 Jones, F. M., Sacramento, Cal.  
 ★Kasner, A. H., 152 Church St., N. Y. City.  
 Keidel, Henry Co., 405 W. German St., Baltimore, Md.  
 Kelly-Howe, Thompson St., Duluth, Minn.  
 Kessler, C. S. & Bro., Washington, D. C.  
 Kimball, Upson & Co., Sacramento, Cal.  
 Leacock Sporting Goods Co., R. J., St. Louis, Mo.  
 Lee-Glass-Andresson Hardware Co., Omaha, Neb.  
 Leng's, John S. Son & Co., 33 Murray St., New York, N. Y.  
 Logan-Gregg Hardware Co., Pittsburg, Pa.  
 ★Manufacturers' Supplies Co., 418 Arch St., Phila., Pa.  
 Marshall Wells Hardware Co., Duluth, Minn.  
 Martin, J. H. & Co., Little Rock, Ark.  
 Mayo, James, 222 Penn St., Reading, Pa.  
 McIntosh Hardware Corporation, Cleveland, O.  
 Merry, E. F., 224 Van Ness Ave., San Francisco, Cal.  
 Miller, Chas. E., 97-101 Reade St., N. Y. City.  
 Monnier Cycle Supply Co., Detroit, Mich.  
 Morley Bros., Saginaw, Mich.  
 Morley-Murphy Hardware Co., Green Bay, Wis.  
 ★New York Sporting Goods Co., 15-17 Warren St., N. Y. City.  
 Norvell, Shapleigh & Co., St. Louis, Mo.

**JOBBERS, Cycle Parts and Sundries—Continued**

- Nock, Geo. W. Co., 126 N. Fourth St., Philadelphia, Pa.  
 Ollier & Worthington, Los Angeles, Cal.  
 Olmsted, H. R. & Son, Syracuse, N. Y.  
 Pacific Coast Rubber Co., Tacoma, Wash.  
 Pacific Coast Rubber Co., Portland, Ore.  
 Parker, J. P. & Co., Memphis, Tenn.  
 Parmelee, S. S. Company, Macon, Ga.  
 Post & Lester Co., 20 Sargeant St., Hartford, Conn.  
 Pritzlaff Hardware Co., Milwaukee, Wis.  
 Progressive Cycle & Auto Supply Co., 81 Chambers St., New York, N. Y.  
 Read, Wm. & Sons, Boston, Mass.  
 Richards & Conover Hardware Co., Kansas City, Mo.  
 Roby, S. B. Co., The, 208 South Ave., Rochester, N. Y.  
 Rochester Rubber Co., Rochester, N. Y.  
 Rumme Arms Co., A. J., Toledo, O.  
 Salt Lake Hardware Co., Salt Lake City, Utah.  
 Schmelzer Arms Co., Kansas City, Mo.  
 Scott Supply & Tool Co., Denver, Colo.  
 Shroyer & Co., Geo. W., Dayton, O.  
 Simmons Hardware Co., St. Louis, Mo.  
 Smith, C. J. & Co., St. Paul, Minn.  
 Spalding & Co., 109-13 W. Jefferson St., Syracuse, N. Y.  
 Standard Tire & Rubber Co., 102 Portland St., Boston, Mass.  
 Storck, F. C., Red Bank, N. J.  
 Strauss, Jos. & Son, 197-201 Genesee St., Buffalo, N. Y.  
 Supplee Hardware Co., 503 Market St., Philadelphia, (Sundries.)  
 Sutcliffe Co., The, Louisville, Ky.  
 Swartz, W. P., York, Pa.  
 Syracuse Rubber Co., Syracuse, N. Y.  
 Tracy, Wells Co., Columbus, O.  
 Treman, King & Co., Ithaca, N. Y.  
 Tryon, Edw. K., Jr., & Co., Phila., Pa.  
 Tufts Lyons Arms Co., Los Angeles, Cal.  
 Union Supply Co., Toledo, O.  
 Utica Cycle Co., 115-119 Columbia St., Utica, N. Y.  
 Van Camp Hardware & Iron Co., Indianapolis, Ind.  
 Vim Cycle & Hardware Co., 228-30 Broadway, New York, N. Y.  
 Walthour & Hood, Atlanta, Ga.  
 Wells, Prince, 718-20 Fourth St., Louisville, Ky.  
 Westing, The, G. H. Co., 219-221 Massachusetts Ave., Indianapolis, Ind.  
 Williams, E. A., Minneapolis, Minn.  
 Wilson Trading Co., The, 46 Cortlandt St., New York, N. Y.  
 Worthington Co., The Geo., Cleveland, O.  
 Wright & Wilhelmy Co., Omaha, Neb.  
 ★Wyeth Hardware Mfg. Co., St. Joseph, Mo.

**KEROSENE BURNERS**

(See Burners.)

**KEROSENE MARINE ENGINES**

(See Marine Kerosene Motors.)

**KNOBS, SPARK & THROTTLE**

Stokes, Jos. Rubber Co., Trenton, N. J. (Hard rubber.)

**KNUCKLE CASES**

(See Grease Bags.)

**KNUCKLES, Steering**

(See Steering Knuckles.)

**LACQUERS**

- Ajax Auto Co., 832-34 E. 43rd St., Chicago, Ill.  
 "Stay Bright." (Brass.)  
 American Lacquer Co., The, Bridgeport, Conn.  
 Arsenal Varnish Co., 25th St. & 4th Ave., Rock Island, Ill. "Arsenal Liquid Gun Metal."  
 Barrett, M. L. & Co., 219 Lake St., Chicago, Ill. (Metal.)  
 Caldwell, E. P. Co., 219 E. Fourth St., Waterloo, Ia. "Caldwell's."  
 Celluloid Zapon Co., New York, N. Y. (Metal.)  
 Egyptian Lacquer Mfg. Co., The, 152 Front St., N. Y. City. (Metal.)  
 Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O. "Forest City."  
 Hanson & Van Winkle Co., Newark, N. J. "H & V W." (Metal.)  
 Hercules Chemical Works, 1904 W. Van Buren St., Chicago, Ill.  
 New Era Lustre Co., New Haven, Conn. (Metal.)  
 Longhurst, Jas. S., Jr., Lynbrook, L. I., N. Y. (Aluminum for iron work.)  
 Maas & Waldstein Co., N. Y. City. (Metal lacquers.)  
 Nikolas, G. J. & Co., 85 Centre St., N. Y. City. (Metal.)  
 Zinsser, Wm. & Co., 195 William St., N. Y. City. (Metal.)

**LAMPS, Acetylene Auto**

- Autolyte Mfg. Co., 26 Warren St., N. Y. City. "Autolyte" & "Climax."  
 B. & L. Auto Lamp Co., 507-09 W. 35th St., N. Y. City.  
 ★Badger Brass Mfg. Co., The, Kenosha, Wis. "Solar."  
 Ball-Fintze Co., The, Newark, O. "Avalon."  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Maximus."  
 Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.  
 Brown, The J. W. Mfg. Co., Columbus, O.  
 Buffalo Lamp Co., 191 Clinton St., Buffalo, N. Y.  
 Castle Lamp Co., The, Toledo, Ohio. "Atwood."  
 Chicago Auto Lamp Works, 71-75 W. Jackson Blvd., Chicago, Ill. "Diamond."  
 Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, Ohio.  
 Corcoran Bros., Co., 712 Reading Road, Cincinnati, O.  
 ★Dietz, R. E. Co., 60 Laight St., N. Y. City. "Majestic."  
 ★Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich. "E. & J."

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**LAMPS, Acetylene, Auto—Continued**

- English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Franco-American Lamp Co., 157 W. 54th St., N. Y. City.
- Gray & Davis, Amesbury, Mass. "Gray & Davis."
- Hall, C. M. Lamp Co., Detroit, Mich.
- ★Ham, C. T. Mfg. Co., Rochester, N. Y.
- Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-man-Co."
- Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Columbia."
- Hofacker, G., 553-55 W. 42nd St., N. Y. City.
- Hudson Auto Lamp Works, 1646-48 Broadway, N. Y. City.
- Indiana Lamp Co., Connersville, Ind. "Empire."
- Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City. "Phoenix."
- Motor Car Equipment Co., The, 55 Warren St., N. Y. City.
- ★New York Auto Lamp Co., 68 Clarkson St., N. Y. City.
- New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."
- Pittsburg Lamp, Brass & Glass Co., Pittsburg, Pa.
- Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. "Royal De Luxe."
- Pyle Mfg. Co., Indianapolis, Ind.
- ★Rose Mfg. Co., 911 Arch St., Phila., Pa. "Nev-erout."
- ★Rushmore Dynamo Works, 629 South Ave., Plainfield, N. J. "Rushmore."
- Saxon Lamp Co., Inc., 530 W. 28th St., N. Y. City. "Saxon."
- Scoville & Peck Co., 15 Wooster St., New Haven, Conn. "Peck."
- Sprague-Waldo Mfg. Co., 18 Piquette Ave., E. Detroit, Mich.
- Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.
- Victor Lamp Co., 1229 Plum St., Cincinnati, Ohio.
- Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal. "Western Spherical."

**LAMPS, Electric Automobile**

- Adams & Westlake Co., 319 Ontario St., Chicago, Ill. "Adlake."
- ★Apple Electric Co., 20 N. Canal St., Dayton, O. "Aplico."
- ★Badger Brass Mfg. Co., Kenosha, Wis. "Badger."
- Baum's Brass & Model Works, 244 Third Ave., S., Minneapolis, Minn.
- Benolst Bros. Mfg. Co., 3923 Olive St., St. Louis, Mo. "Black Jack."
- Black Mfg. Co., 118-20 W. Wayne St., Fort Wayne, Ind.
- Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.
- Buffalo Lamp Co., 191 Clinton St., Buffalo, N. Y.
- Castle Lamp Co., The, Toledo, Ohio. "Atwood."
- Chicago Auto Lamp Works, 71-75 West Jackson Blvd., Chicago, Ill. "Diamond."

- Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O.
- ★Couch & Seeley Co., 10 Thacher St., Boston, Mass. (Combination electric tail light & number holder.)
- ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "Resume," "Delaware," "Elgin" & "Globe" (tail) & "Ruskin," "Rimmon," "Acatena" & "Record" (side.)
- ★Dietz, R. E. Co., 60 Laight St., N. Y. City. "Sentinel."
- ★Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich. "E. & J."
- ★Electric Storage Battery Co., 19th St. & Allegheny Ave., Phila., Pa. "Hyaray."
- Electro Importing Co., 86 W. Broadway, N. Y. City. "Radioflex."
- English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Geen Electrical Mfg. Co., 180 E. Lake St., Chicago, Ill. "Genco." (Miniature & candleabra.)
- ★General Electric Co., Schenectady, N. Y. "G. E."
- Gordon, Thos. S. Co., P. O. Box 1564, Chicago, Ill. (Tail lamp for illuminating license numbers.)
- Gray & Davis, Amesbury, Mass. "Gray & Davis."
- Guide Motor Lamp Mfg. Co., 2069 E. Fourth St., Cleveland, O. "Guide."
- Hall, C. M. Lamp Co., Detroit, Mich. (Combination oil & electric.)
- ★Ham, C. T. Mfg. Co., Rochester, N. Y. "Venus."
- Hammer & Hull, 1837-39 Euclid Ave., Cleveland, O.
- Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-man-co."
- Helios Mfg. Co., Bridesburg, Pa. "Helios."
- Holt & Beebe, 40 Sudbury St., Boston, Mass.
- Hudson Auto Lamp Works, 1646-48 Broadway, N. Y. City.
- ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.
- Indiana Lamp Co., Connersville, Ind. "Empire."
- Jordan Equipment Co., Beverly, Mass. "Foy." (Electric rear light & number holder.)
- ★K-W Ignition Co., The, 40 Power Ave., Cleveland, O. "K-W."
- Northwestern Storage Battery Co., 140 Mason St., Milwaukee, Wis. "Northwestern."
- O'Brien Electrophone Co., Inc., Hollowell, Me. (Arc & incandescent.)
- Ohio Electric Works, 6304 Ellen Ave., N. W., Cleveland, O. "Ohio."
- Parker, John L. Co., Worcester, Mass. "Parker."
- Richardson Engineering Co., 107 Liberty St., N. Y. City.
- Saxon Lamp Co., Inc., 530 W. 28th St., N. Y. City. "Saxon."
- Scoville & Peck Co., 15 Wooster St., New Haven, Conn. "Peck."
- Sprague-Waldo Mfg. Co., 18 Piquette Ave., E. Detroit, Mich.
- Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City.
- Sun Lamp Works, 1905 Sunnyside Ave., Chicago, Ill.
- Universal Electric Storage Battery Co., 301-09 N. Peoria St., Chicago, Ill. "Universal."
- Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. "Vesta."
- Victor Lamp Co., The, 1249 Plum St., Cincinnati, Ohio.
- Volkcar Storage Battery Co., 2441-2443 Michigan Ave., Chicago, Ill. "Volkcar."



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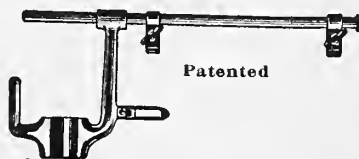
the only sure way to comply with the law—throws light directly on license tag.

Tag cannot swing, cannot rattle, cannot mar car, cannot be lost, is firmly held in place by adjustable metal clasps.

Instantly attachable and detachable when touring other states.

This shows why the Neverout License Bracket fits any tail lamp, is easily attached to your present tail lamp bracket, requires no drilling of frame.

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**LAMPS, Electric, Automobile—Continued**

- ★White Mfg. Co., 155 Cannon St., Bridgeport, Conn.
- ★Widman, J. C. & Co., 14th, 15th, Kirby Ave. & G. T. Ry., Detroit, Mich. (Also combination oil & electric.)
- ★Willard Storage Battery Co., Marquette Rd. & Lakeside, Cleveland, O. "Elba."
- Witherbee Igniter Co., Springfield, Mass. "Wico."

**LAMPS, Oil Automobile**

- Adams & Westlake Co., 319 Ontario St., Chicago, Ill. "Adlake."
- American Lamp Works, 253 W. 47th St., N. Y. City. "Liberty."
- ★Badger Brass Mfg. Co., The, Kenosha, Wis. "Solar."
- Ball-Fintze Co., The, Newark, Ohio. "Avallion."
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Maximus."
- Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.
- Brown, The J. W. Mfg. Co., Columbus, O.
- Castle Lamp Co., The, Toledo, O. "Atwood."
- Corcoran Bros. Co., 712 Reading Road, Cincinnati, O.
- ★Dietz, R. E. Company, 60 Laight St., N. Y. City. "Orient," "Regal," "Dainty," "Sterling," "Ideal," "Sterling Junior" & "Taxi."
- ★Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich. "E. & J."
- English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Franco-American Lamp Co., 157 W. 54th St., N. Y. City.
- Gray & Davis, Amesbury, Mass. "Gray & Davis."
- Hall, C. M. Lamp Co., Detroit, Mich. (Also combination oil and electric.)
- ★Ham, C. T. Mfg. Co., Rochester, N. Y. "Ham Genuine," "Cold Blast," "Rochester," "Tourist," "Reliance," "Aurora," "Corona," "Coupe," "Meteor," "Monitor," "Star," "Vigilant" & "Mars."
- Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-man-co."
- Hudson Auto Lamp Works, 1646-48 Broadway, N. Y. City.
- Indiana Lamp Co., Connersville, Ind. "Empire."
- Lockwood Co., The, 34 Mechanic St., Newark, N. J.
- Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City. "Phoenix."
- ★New York Auto Lamp Co., 68 Clarkson St., N. Y. City. "Aurora."
- New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."
- Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. "Royal De Luxe."
- ★Rose Mfg. Co., 911 Arch St., Phila., Pa. "Neverout."
- Saxon Lamp Co., Inc., 530 W. 28th St., N. Y. City. "Saxon."
- Scoville & Peck Co., 15 Wooster St., New Haven, Conn. "Peck."
- Sprague-Waldo Mfg. Co., 18 Piquette Ave., E., Detroit, Mich.
- Victor Lamp Co., The, 1249 Plum St., Cincinnati, O.
- Widman, J. C. & Co., 14th, 15th, Kirby Ave. & G. T. Ry., Detroit, Mich. (Also combination electric & oil.)

**LAMPS, Boat**

- American Acetylene Stove Co., 504 Masonic Temple, Minneapolis, Minn. "Clear View." (Acetylene.)
- American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City. (Oil & electric.)
- ★Badger Brass Mfg. Co., The, Kenosha, Wis. "Solar." (Oil & electric.)
- Boesch Lamp Co., 1135 Mission St., San Francisco, Cal. (Electric & oil.)
- Buffalo Lamp Co., 191 Clinton St., Buffalo, N. Y. (Electric.)
- Carlisle & Finch Co., 229 E. Clifton Ave., Cincinnati, O. (Electric.)
- Curtiss Company, 20 Fulton St., N. Y. City. (Port lights.)
- Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich. "E. & J." (Acetylene, electric & oil.)
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill. (Electric.)
- Guide Motor Lamp Mfg. Co., 2069 E. Fourth St., Cleveland, O. "Guide." (Electric.)
- Hammer & Hull, 1837-39 Euclid Ave., Cleveland, O. (Electric.)
- Indiana Lamp Co., Connersville, Ind. "Empire." (Oil, electric & acetylene.)
- ★K-W Ignition Co., The, 40 Power Ave., Cleveland, O. "K-W." (Electric.)
- Motor Car Equipment Co., The, 55 Warren St., N. Y. City. (Acetylene.)
- Richardson Engineering Co., 107 Liberty St., N. Y. City. (Electric.)
- ★Rose Mfg. Co., 911 Arch St., Phila., Pa. "Neverout." (Acetylene & oil.)
- ★Rushmore Dynamo Works, 629 South Ave., Plainfield, N. J. "Rushmore." (Acetylene.)
- Sprague-Waldo Mfg. Co., 18 Piquette Ave., E., Detroit, Mich. (Acetylene & electric.)
- Sun Lamp Works, 1905 Sunnyside Ave., Chicago, Ill. (Electric.)

**LAMPS, Boat Interior**

- American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City. (Oil cabin lamps.)
- ★Rose Mfg. Co., 911 Arch St., Phila., Pa. "Neverout." (Gas & oil.)

**LAMPS, Cycle & Motor Cycle**

- ★Badger Brass Mfg. Co., Kenosha, Wis. "Solar." (Gas & oil.)
- ★Bridgeport Brass Co., Cor. Fairfield & Holland Aves., N. Y. City. "Searchlight." (Gas & oil.)
- Chicago Auto Lamp Works, 71-75 W. Jackson Blvd., Chicago, Ill. "Diamond." (Gas.)
- Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Columbia." (Gas & oil.)
- Motor Car Equipment Co., The, 55 Warren St., N. Y. City. (Acetylene.)
- Ohio Electric Works, 6304 Ellen Ave., N. W., Cleveland, Ohio. "Ohio." (Electric.)
- ★Rose Mfg. Co., 911 Arch St., Phila., Pa. "Neverout." (Gas & oil.)
- Saxon Lamp Co., Inc., 530 W. 28th St., N. Y. City. (Motorcycle, gas.)
- 20th Century Lamp Co., 19 Warren St., N. Y. City. "20th Century." (Oil & gas, cycle & acetylene, motorcycle.)

## LAMP ADAPTERS

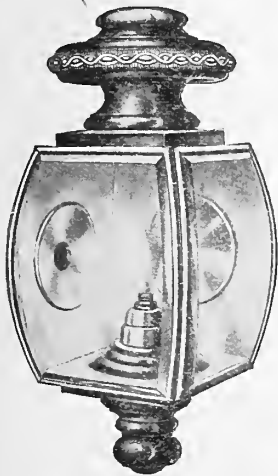
- Arseno Electric Co., 819A Boylston St., Boston, Mass. "Arseno." (Electric.)
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Fitzall."
- Culver-Stearns Mfg. Co., 31 Southbridge St., Worcester, Mass. "C-S."
- ★Dietz, R. E. Co., 60 Lighthouse St., N. Y. City. ("Presto" acetylene, & "Comet" electric.)
- Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Excelsior."
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Gerdelman, Benjamin Mfg. Co., 4630 Olive St., St. Louis, Mo. "Dark Light."
- Hall, C. M. Lamp Co., Detroit, Mich.
- Howard Miniature Lamp Co., Newark, N. J.
- ★K-W Ignition Co., The, 40 Power Ave., Cleveland, O. "K-W."
- McCandless, H. W. & Co., 67-69 Park Place, N. Y. City. (Electric.)
- Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill. "Gil-Bo."
- Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. "Fitzall."
- Newlin, W. D., Paxton, Ill. "Newlin's Hold Tight."
- Witherbee Igniter Co., Springfield, Mass. "Wico."

## LAMP BATTERIES

(See Ignition Batteries, Storage.)

## LAMP BRACKETS, Auto

- (Including Automatic Adjusting Fixtures.)
- Acme Metal Mfg. Co., 43-49 S. Canal St., Chicago, Ill.
- Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.
- Automatic Headlight Co., 299 Broadway, N. Y. City. "Shipley." (Self adjusting.)
- B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, Ohio.
- ★Badger Brass Mfg. Co., The, Kenosha, Wis. "Solar." (Auto & boat.)
- Castle Lamp Co., The, Toledo, O. "Atwood."
- Century Specialty Co., 1079 Bruck St., Columbus, O.
- Chicago Auto Lamp Works, 71-75 West Jackson Blvd., Chicago, Ill. "Diamond." (Swivel.)
- Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel to order.)
- Circle Rotary Automobile Light Co., Box 354, Great Neck, N. Y. (Adjustable.)
- ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- Cranmer, Harry C., 217 S. 24th St., Phila., Pa.
- ★Crosby Co., 171-89 Pratt St., Buffalo, N. Y.
- Curry & Abeles, 229 Mulberry St., Newark, N. J.
- Donaldson, W. H., Joliet, Ill. (Revolving.)
- ★Douglas & Lomason Co., 302 Grand River Ave., Detroit, Mich.
- Downing, Chas. J., 1777 Broadway, N. Y. City. "Downing."
- Driggs-Seabury Ordnance Corp., Sharon, Pa.
- English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn.
- Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.
- Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.



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FOOT RESTS, etc.

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For Electric Vehicles and Limousines  
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Dome or Roof Lights  
Holophane, Frosted, Cut and Clear Glass  
in great variety

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**LAMP BRACKETS, Auto—Continued**

- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.  
 ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, Ohio.  
 Halderman, O. E., Marion, Ind. (Adjustable & automatic.)  
 Hall, C. M. Lamp Co., Detroit, Mich.  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."  
 Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill.  
 Hungerford, U. T., Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. "Imperial." (Adjustable & stationary.)  
 Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
 Kelly Handle Bar Co., 5017 Perkins Ave., Cleveland, O.  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
 Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J.  
 Luce Mfg. Co., Inc., Dalton, Mass. "Luce." (Shifting.)  
 M. A. N. Mfg. Co., 257 W. Exchange St., Providence, R. I. "Manco."  
 Machine Accessories & Novelties Mfg. Co., 257 W. Exchange St., Providence, R. I. (Adjustable.)  
 Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City. "Phoenix."  
 Metallic Specialties Co., 4228 Ludlow St., Phila., Pa.  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Perfection."  
 ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill.  
 National Automatic Fender & Appliance Co., 100 Boylston St., Boston, Mass. (Adjustable.)  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."  
 Northway, Thos. J., 92 Exchange St., Rochester, N. Y. "Rochester." (Adjustable.)  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Pendleton Auto Garage, Westfield, Mass. "McKean." (Adjustable.)  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich. (Adjustable & stationary.)  
 ★Rose Mfg. Co., 911 Arch St., Phila., Pa.  
 ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich.  
 ★Standard Welding Co., Cleveland, O.  
 ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."  
 ★Victor Auto Supply Mfg. Co., 42 West 43rd St., N. Y. City. "Vasco."  
 Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill.  
 Woodruff, The Walter W. & Sons Co., Mt. Carmel, Conn.

**LAMP BRACKETS, Cycle & Motor Cycle**

- Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y. "Forsyth." (Cycle.)  
 Motorcycle Specialty Co., The, 258 Columbus Ave., Boston, Mass. (Combination lamp, generator & repair kit bracket for motor cycles.)  
 Mueller, L. J., 6417 Woodland Ave., S. E., Cleveland, Ohio. "Mueller." (Motor cycle.)

- ★Rose Mfg. Co., 911 Arch St., Phila., Pa.  
 Swenson, B. A., 298 Blackstone St., Corner Prairie Ave., Providence, R. I. "Swenson." (Motor cycle.)

**LAMP CONNECTIONS**

(See Tubing, Soft Rubber; &amp; Lamp Parts.)

**LAMP COVERS**

(See Covers, Lamp.)

**LAMP LENSES**

- (See also Mirrors & Reflectors, Lamp.)  
 Bausch & Lomb Optical Co., Rochester, N. Y.  
 Fry, H. C. Glass Co., Rochester, Pa.  
 Macbeth-Evans Glass Co., Pittsburg, Pa.  
 ★Matisse, C. & A., 543-549 E. 116th St., N. Y. City. "Matisse." (Condensing.)

**LAMP LIGHTERS**

- Adjustable Lighter Co., 18 Pearl St., Newton, Mass. (Adjustable, electric.)  
 Auto Parts Co., 10 Weybosset St., Providence, R. I. "Apco." (For Fords.)  
 Electric Goods Mfg. Co., Canton, Mass. "Gem" & "Jewel." (Electric.)  
 Elliott, Chas. & Co., 422 N. Charles St., Baltimore, Md. "Elliott." (Acetylene.)  
 Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill. "Fowler."  
 Haase Motor Works, 1017 Lloyd St., Milwaukee, Wis. "C-H." (Gas lighters.)  
 Hart & Fuller, 9 South St., Hartford, Conn. "Hart." (For gas lamps.)  
 Inst Lighter Co., The, Columbus, O. "Inst." (For gas lamps.)  
 International Mfg. Co., The, 202 Marine Bank Bldg., Baltimore, Md.  
 ★Lazelle, U. E. & Co., Battle Creek, Mich. "Ideal."  
 Motor Specialties Co., Motor Mart, Boston, Mass. "Flash."  
 Rolf, C. D., Redlands, Cal. "Auto-Light."  
 Wilson, H. K. Mfg. Co., New Bedford, Mass. "Wilson." (Electric.)



**LAMP NUMBERS**

(See Metal Figures.)

**LAMP PARTS & FITTINGS**

- Benoist Bros. Mfg. Co., 3923 Olive St., St. Louis, Mo. "Black Jack." (Lamp connectors.)
- Culver-Stearns Mfg. Co., 34 Southbridge St., Worcester, Mass. "C-S." (Lamp connectors.)
- Gerdelman, Benjamin Mfg. Co., 4630 Olive St., St. Louis, Mo. "Dark Light." (Limousine lighting fixtures.)
- Goodnow & Blake Mfg. Co., 4th & Porter Sts., Detroit, Mich.
- Guide Motor Lamp Mfg. Co., 2069 E. Fourth St., Cleveland, O. "Guide."
- ★Morse, Frank W., 516 Atlantic Ave., Boston, Mass. "Morse." (Plug connectors, cord adjusters & fibre candelabra base sockets.)
- Paschke, Wm., 1777 Broadway, N. Y. City. (Detachable lamp diffuser.)
- Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. (Lamp connections.)
- Uniform Seamless Wire Co., 71 Peck St., Providence, R. I. (Brass Y's & T's for lamp connections.)
- Witherbee Igniter Co., Springfield, Mass. (Lamp connections.)

**LAMP REPAIRING**

- Baum's Brass & Model Works, 244 Thrd Ave., S., Minneapolis, Minn.
- Boston Nickel Plating Co., Inc., 160 Portland St., Boston, Mass.
- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.
- Quinby, J. M. & Co., 21-33 Division St., Newark, N. J.

**LAMP STANDS**

- Arnold Auto Specialty Co., Garfield, N. J. "Fixat-Nite."

**LAMP TUBING**

(See Rubber Tubing.)

**LAUNCH FITTINGS**

- Bath Marine Construction Co., Bath, Me.
- Benton, Thos. P. & Son, La Crosse, Wis.
- Carleton Canoe Co., 700 Main St., Old Towne, Me.
- Durkee, C. D. & Co., Inc., 2 South St., N. Y. City.
- Kaufmann, Chas., 28 Main St., Oshkosh, Wis.
- Laughlin, The Thos. Co., 143 Fore St., Portland, Me.
- Moto Marine Engine & Boat Repair Co., 126 Liberty St., N. Y. City.
- Pancoast, Henry B. Co., 2110 Allegheny Ave., Phila., Pa. (Brass & Iron.)

**LAVATORIES**

- Curtiss Company, 20 Fulton St., N. Y. City.
- Goblet-Dolan Co., 30 Old Slip, N. Y. City.
- "C-Yacht." (Folding.)
- Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City. (Folding.)

**LEAF SPRINGS**

(See Springs, Leaf.)

**LEATHER**

- (For Tires, Clutches, Valves, etc.)
- ★American Belting & Tanning Co., 135 Oliver St., Boston, Mass. (For tires.)
- Apex Belting Co., 242 Chestnut St., Phila., Pa. (Clutch & tire.)
- Armstrong & Graham, 126 Jefferson St., Detroit, Mich.
- Bradford Belting Co., The, Cincinnati, Ohio. "Monarch." (Lace.)
- Chicago Rawhide Mfg. Co., 348-50 Ohio St., Chicago, Ill. "Krome." (Friction.)
- Coe & Brown, 202-204 George St., New Haven, Conn. (Strap.)
- Crandall Packing Co., Palmyra, N. Y. "Crandall." (Lace.)
- Detroit Leather Works, 844 Woodward Ave., Detroit, Mich. (Clutch leather.)
- Gay, Fred E., 170 Front St., Pawtucket, R. I. (Rawhide lace leather & lacings.)
- Graton & Knight Mfg. Co., 94-104 Bloomingdale Rd., Worcester, Mass. (Valve & clutch.)
- Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City. (Brake & clutch.)
- Hatch Bros., 87 Gold St., N. Y. City. (For tires.)
- Houghton, E. F. & Co., 240 W. Somerset St., Phila., Pa. "Vim" (for tires, clutches and brakes.)
- Mau-Sherwood Supply Co., 1616 W. Third St., Cleveland, O. (Friction.)
- Missouri Belting Co., St. Louis, Mo. (Rawhide, lace.)
- National Leather Belting Co., 29 Ferry St., N. Y. City. "Long Life." (Rawhide lace & clutch.)
- National Leather Mfg. Co., Niles, Mich. (Rawhide lace.)
- New York Leather Belting Co., N. Y. City. (For clutches.)
- Norwich Belt Mfg. Co., Inc., The, Norwich, Conn. (Rawhide lace leather & chrome tire sleeve leather.)
- Page Belting Co., Concord, N. H. (Clutch.)
- Philadelphia Belting Co., 313-15 Vine St., Phila., Pa. (Lace leather & lacing, hydraulic & pump leather.)
- Reilly, P. & Son, Mott & Passaic Ave., Newark, N. J.
- Schieren, Chas. A. Co., Schieren Bldg., N. Y. City. "Schieren's." (Clutch, valve, lace & hydraulic leather.)
- Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's Velvet" (for clutches.)
- Weatherhead-Thompson Co., Pawtucket, R. I. (Rawhide lace.)
- Williams, I. B. & Sons, Dover, N. H. "Oriole" & "Cocheco." (Lace & clutch leather.)

**LEATHER, Trimming**

- American Leather Mfg. Co., Newark, N. J.  
"Stag Brand."
- American Oak Leather Co., Cincinnati, O.
- Ashtabula Hide & Leather Co., Ashtabula, O. "Ashtabula."
- Atlantic Leather Co., Wright St. & Ave. A. Newark, N. J. "Keystone." (Patent & enameled leather for upholstering dashes & tops.)
- Badger State Tanning Co., Sheboygan, Wis. "Colonial."
- Boston Artificial Leather Co., 310 Fourth Ave., N. Y. City. "Moroccoline." (Imitation leather.)
- Bridgeport Patent Leather Mfg. Co., Bridgeport, Conn. "Charter Oak."
- Byron, W. D. & Sons, Williamsport, Md. (Natural.)
- Caffrey, M. Leather Co., 488 Frelinghuysen Ave., Newark, N. J.
- Celluloid Co., 30 Washington Pl., N. Y. City. "Texoderm." (Imitation leather.)
- Chandler Oil Cloth & Buckram Co., East Taunton, Mass. (Artificial.)
- ★Chase, L. C. & Co., 89 Franklin St., Boston, Mass. (Imitation.)
- Cleveland Tanning Co., Jennings & Dennison Aves., S. W., Cleveland, O. (Natural.)
- Eldred Leather Co., Eldred, Pa.
- Fabrikoid Co., The, Newburgh, N. Y. "Fabrikoid." (Imitation leather.)
- Fairfield Rubber Co., The, Fairfield, Conn. (Imitation.)
- Holliday, W. J. & Co., Indianapolis, Ind.
- Howell, T. P. & Co., Newark, N. J.
- Keratol Company, The, Cor. South & Van Buren Sts., Newark, N. J. "Keratol." (Imitation.)
- Klauder, Chas. L. Co., B St. & Allegheny Ave., Phila., Pa. "Five Brothers."
- Kroh, C. Z. Mfg. Co., 1212-1214 Jackson St., Toledo, O. "Kroh."
- Lackawanna Leather Co., Hackettstown, N. J.
- Lounsbery, G. H. & Sons, 107-109 W. Third St., Cincinnati, O. (Imported.)
- Nelson, A. T. A. Co., 2528 Colerain Ave., Cincinnati, O.
- O'Bannon Corp., 74 Duane St., N. Y. City. "O'Bannon."
- Parry, A. N. & Co., Amesbury, Mass. (Artificial leather.)
- Radel Leather Mfg. Co., Hamburg Place, N. J.
- Raser Tanning Co., Ashtabula, Ohio.
- Reilly, P. & Son, Mott & Passaic Aves., Newark, N. J.
- Rex Imperial Leather Co., 12-28 Chapel St., Newark, N. J.
- Smith, Hugh Co., Newark, N. J.
- Smith, L. M. & Sons, 59 Lock St., Newark, N. J. (Natural.)
- Smyth, Charles Co., 240-50 Central Ave., Newark, N. J.
- Standard Leather Co., 296 Spring Garden Ave., Pittsburg, Pa.
- Terwilliger-Stone Leather Co., 210 N. J. R. Ave., Newark, N. J.
- Trenton Oil Cloth & Linoleum Co., Trenton, N. J. "Cook's." (Imitation.)
- Turner & Rutter, 32 Spruce St., N. Y. City. (Morocco.)
- Ward, E. S. & Co., Waverly, Newark, N. J.

**LEATHER DRESSING**

(See Top Dressing.)

**LEGGINGS**

- American Tire Co., Owosso, Mich. "Salisbury."
- Chanavas & Son, 920 Eighth Ave., N. Y. City.
- Clifton Mfg. Co., Boston, Mass. (Rubber.)
- Cook, E. C. & Bro., 49 E. Kinzie St., Chicago, Ill.
- Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City.
- Kaufman-Dryfoos Co., 257-65 W. 17th St., N. Y. City.
- ★Nathan Novelty Mfg. Co., 84-90 Reade St., New York, N. Y. "Nathan."
- Spear-Martin Fur Co., 41 Church St., Burlington, Vt. "Spear's Adirondack."
- Wiley, The Wm. H. & Son Co., Box 78, Hartford, Conn.

**LENSES**

(See Lamp Lenses.)

**LEVERS, Brake**

- Auto Parts Mfg. Co., South Elliot St., & T. E. W. R., Muncie, Ind. "B.T.K."
- Bates Forge Co., The, Indianapolis, Ind.
- ★Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."
- Covert Motor Vehicle Co., Lockport, N. Y. "Covert."
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- Driggs-Seabury Ordnance Corporation, Sharon, Pa.
- ★General Mfg. Co., The, Elkhart, Ind.
- Indiana Auto Parts Co., Marion, Ind.
- Jamesville Mfg. Co., Jamesville, N. Y. "Red-skin."
- Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.
- Locke Regulator Co., Salem, Mass. "Panhard."
- ★Long Arm System Co., East 38th St., & Lakeside Ave., Cleveland, O.
- ★McCue Co., Hartford, Conn.
- Michigan Auto Parts Co., 1559-1561 Jefferson Ave., Detroit, Mich.
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- Reading Automobile Co., 26-28 S. 5th St., Reading, Pa. "Victor."
- Roebbling's John A. Sons Co., Trenton, N. J. (Cables.)
- ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.
- ★Standard Welding Co., 76th St. & L. S. & M. S. Ry., Cleveland, O.
- Syracuse Gear Co., 105 Grape St., Syracuse, N. Y.
- ★Warner, T. W. Co., Muncie, Ind.
- ★Warner Gear Co., Muncie, Ind. "Warner."
- ★Warner Mfg. Co., Toledo, O.

**LEATHER BELTING**

(See Belting.)

★ indicates Advertisers—see Index in back of book.

**LEVERS, Spark and Throttle**

Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Control, cast steel, to order.)

- ★General Mfg. Co., The, Elkhart, Ind.
- Johnston & Jennings, 877 Addison Rd., Cleveland, O.
- Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.
- Lewis Spring & Axle Co., Jackson, Mich.
- ★McCue Co., Hartford, Conn. (Control.)
- Morss, A. S. Co., 210-12 Commercial St., Boston, Mass. "Morss." (Marine.)
- ★Mosler, A. R. & Co., 163 W. 29th St., New York City. "Self-snap." (Spark controlling & cutout levers.)
- Warner Brothers, Cor. High & Howard Sts., Muncie, Ind.
- Warner, T. W. Co., Muncie, Ind.
- ★Warner, T. W. Co., Muncie, Ind.

**LEVER GRIPS**

(See Grips, Spark and Throttle Lever.)

**LEVER LOCKS**

Bongartz Co., The, 423 Broome St., N. Y. City. "Auto Lock."

**LEVER SECTORS**

Bossert Co., The, Utica, N. Y. (To order.)

**LEVERS, Speed Change**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
- ★American Die & Tool Co., Reading, Pa. (Side shifting.)
- Auto Parts Mfg. Co. South Elliot St. & T. E. W. R., Muncie, Ind. "B.T.K."
- Bates Forge Co., The, Indianapolis, Ind.
- Berry, Chas. W., Gray, Me. "Berry."
- Christopher Bros., 3308 Sheffield Ave., Chicago, Ill. "Triumph."
- Cotta Transmission Co., 814-18 S. Main St., Rockford, Ill. "Cotta." (Lever set.)
- Covert Motor Vehicle Co., Lockport, N. Y. "Covert." (Side control.)
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- Driggs-Seabury Ordnance Corp., Sharon, Pa.
- ★General Mfg. Co., The, Elkhart, Ind.
- Indiana Auto Parts Co., Marion, Ind.
- Janesville Mfg. Co., Janesville, N. Y. "Red-skin."
- Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.
- Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.
- Locke Regulator Co., Salem, Mass. "Panhard." (Side.)
- ★Long Arm System Co., E. 38th St. & Lakeside Ave., Cleveland, O.
- Michigan Auto Parts Co., 1559-1561 Jefferson Ave., W., Detroit, Mich.
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.
- ★Standard Welding Co., The, 76th St., N. W. & L. S. & M. S. R. R., Cleveland, O.
- Syracuse Gear Co., 105 Grape St., Syracuse, N. Y.
- Wabash Gear Works, Terre Haute, Ind.
- ★Warner Gear Co., Muncie, Ind. "Warner."
- ★Warner, T. W. Co., Muncie, Ind.
- ★Warner Mfg. Co., Toledo, O.

**LICENSE HANGERS**

(See also Metal Figures.)

- Aluminum Goods Mfg. Co., Newark, N. J.
- Art Sign Co., Room C, De Graaf Bldg., Albany, N. Y.
- Automobile License Indicator Co., Lewisburg, Tenn. "Perfection," "Standard" & "Triumph."
- Automobile Supply Co., 1326 Vine St., Phila., Pa.
- Baltimore Enamel & Novelty Co., Foot of Allen St., Baltimore, Md.
- Balzer, Gus, 1777-79 Broadway, N. Y. City. "Balzer's." (Interchangeable.)
- Bohnet, John & Co., 114-116 Grand Ave., South Lansing, Mich.
- Boyle, John & Co., 112-14 Duane St., N. Y. City.
- Cassady-Fairbank Mfg. Co., The, 6106-30 La Salle St., Chicago, Ill. "Simplex" & "Security."
- ★Couch & Seeley Co., 10 Thacher St., Boston, Mass. (Combination number holder & electric tail light.)
- Fine, Horace E. Co., 19 E. State St., Trenton, N. J. (Also straps.)
- Gordon, Thos. S. Co., P. O. Box 1564, Chicago, Ill. (Electrically illuminated.)
- Ingram-Richardson Mfg. Co., Beaver Falls, Pa.
- Jordan Equipment Co., Beverly, Mass. "Foy." (Electric rear light & number holder.)
- Lighthouse, Chas. F., 877 Seventh Ave., N. Y. City. "Lighthouse."
- ★McKinnon Dash Co., Amherst St., Buffalo, N. Y. "McKinnon."
- Morse, C. H. & Son, 15 S. Water St., Rochester, N. Y.
- Mulhaupt, F. Jos., 227 N. 5th St., LaFayette, Ind.
- Murdock, The James, Jr., Co., 112 Opera Place, Cincinnati, O.
- Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.
- Stafford, N. Co., 67 Fulton St., N. Y. City. "Perfection."
- Stillman, A. P., 124 Chambers St., N. Y. City.
- Whiteford, Jos. G. & Co., 165 N. Jefferson St., Chicago, Ill.

**LEVERS, Steering**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.
- ★General Mfg. Co., The, Elkhart, Ind.
- Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.

**LIGHTERS, Cigar**

(See Cigar Lighters.)

★ indicates Advertisers—see Index in back of book.

**LIGHTING BATTERIES**

(See Batteries, Ignition, Storage.)

**LIGHTING OUTFITS, Auto Electric**

(See also Boat Lighting Outfits.)

- ★Apple Electric Co., 20 N. Canal St., Dayton, O.  
"Apico."
- Kitsee Battery Co., Wilkes-Barre, Pa.
- Perfection Igniter Mfg. Co., 1093 Bedford Ave.,  
Brooklyn, N. Y. "Perfection."
- Stecker Electric & Machine Co., Detroit, Mich.  
"Stecker."

**LIMOUSINE FITTINGS**

- American Ever Ready Co., 304-322 Hudson St.,  
N. Y. City. "Eveready." (Miniature carbon  
& Tungsten lamps.)
- Balzer, Gus, 1777-79 Broadway, N. Y. City.  
(Bouquet holders.)
- Barnard Specialty Co., 800 H. W. Hellman  
Bldg., Los Angeles, Cal. "Barnard."  
(Auto toilet sets.)
- ★Cowles, C. & Co., Water & Chestnut Sts.,  
New Haven, Conn. (Push button switches;  
"Brewster" & "La France" toilet cases;  
bouquet holders; "Tuckers" & "New  
Haven" door anti-rattlers & "Eclipse"  
window anti-rattlers; "Excelsior" window  
strips; "Banner" window lock & anti-rat-  
tlers, arm holder swings & slide rods, meg-  
aphone speaking tube holders, umbrella  
holders & bottom rests, ventilators, front  
window holders, coat hooks, taxicab back,  
light frames.)
- English & Mersick Co., The, 122-26 Winchester  
Ave., New Haven, Conn.
- Fenner, The W. A. Co., Providence, R. I.  
(Miniature incandescent lamps.)
- Horstmann, Wm. H. Company, 5th & Cherry  
Sts., Phila., Pa. (Hat racks.)
- Howard Miniature Lamp Co., Newark, N. J.  
(Miniature Tungsten lamps.)
- ★Imperial Brass Mfg. Co., The, 441 S. Jefferson  
St., Chicago, Ill. "Security." (Robe &  
apparel holder.)
- Levy, Manasseh & Co., 182 Broadway, N. Y.  
City. (Toilet sets.)
- McCandless, H. W. & Co., 67-69 Park Place,  
N. Y. City. "Empire." (Miniature can-  
delabra lamps & sockets.)
- Motor Car Equipment Co., The, 55 Warren St.,  
N. Y. City.
- O'Brien, Jos. F. Co., 63 Park Pl., N. Y. City.  
(Push button switches, toilet cases, venti-  
lating knobs, lace plates, lever lock han-  
dles, arm rest holders, window fasteners  
& anti-rattlers.)
- Parry, A. N. & Co., Amesbury, Mass. (Toilet  
cases.)
- Perpente Mfg. Co., State & Wall Sts., New  
Haven, Conn. (Card & toilet cases.)
- Pratzner, J. V., 61-63 Orange St., New Haven,  
Conn. (Morocco covered toilet cases, etc.)
- ★Ronson Specialty Co., 7 Mulberry St., Newark,  
N. J. "Ronson." (Mirrors, vases, cigar  
holders & dome light casings.)
- ★Rumpp, C. F. & Sons, 5th & Cherry Sts.,  
Phila., Pa. (Card & toilet cases.)
- Seitz, Chas., 512 Third Ave., N. Y. City.  
(Reed bottle or cup holders.)
- Strong, M. H., 168 South Ave., Rochester, N.

Y. (Toilet cases, ventilator slides, um-  
brella & arm sling holders, lace plates,  
etc.)

- Ten Eick, Cornelius, 253 W. 47th St., N. Y.  
City. (Toilet cases.)
- Ward-Leonard Electric Co., The, 12 Swain St.,  
Bronxville, N. Y. "Ward Leonard."
- Warren Electric & Specialty Co., Warren, O.  
"Peerless." (Miniature Tungsten lamps.)
- ★Winship, W. W., 71 Summer St., Boston, Mass.  
(Card cases, toilet sets.)
- Witherbee Igniter Co., Springfield, Mass.  
(Tungsten bulbs.)
- Wolff, Alfred & Co., 45 Vesey St., N. Y. City.  
(Miniature & candelabra, carbon & Tungs-  
sten lamps.)

**LINIMENTS, Salves, Etc.**

- Ericka Mfg. Co., The, Inc., 872-882 Liberty St.,  
Springfield, Mass. "Heald." (Salve for  
chapped hands.)
- Young, W. F., 77 Temple St., Springfield, Mass.  
"Absorbine, Jr."

**LISTS, Owners & Dealers**

- Auto Directories Co., Inc., 1717 Broadway,  
N. Y. City.
- Automobile Advertising Co., 419 State Life  
Bldg., Indianapolis, Ind. (Owners, dealers,  
garages, supply houses, etc.)
- ★Chilton Printing Co., Market & 49th Sts.,  
Phila., Pa. (Dealers.)
- ★Owners' Auto List Co., Capitol P. O. Station,  
Albany, N. Y. (Owners' & chauffeurs'  
registration lists.)
- United States Addressing & Printing Co., 24-  
26 Murray St., N. Y. City. (Also garages  
& motor boat owners & manufacturers.)

**LOCKS, Auto Safety**

- American Auto Motor Locking Device Co., 141-  
43 Stockholm St., Brooklyn, N. Y. (Start-  
ing crank locks.)
- Auto Safety Specialty Co., Buffalo, N. Y. "Au-  
to-Lock." (Combination.)
- Rochester Safety Lock Co., The, Rochester,  
Ind. "Rochester." (Steering post lock.)
- Smith & Yuster Mfg. Co., Rochester, N. Y.  
(Steering column.)
- ★Star Auto Locks, 53 State St., Boston, Mass.
- ★Yale & Towne Mfg. Co., The, 9 Murray St.,  
N. Y. City. "Yale." (Brake & gear shift.)

**LOCKS, Door, Padlocks, Etc.**

(See Hardware.)

**LOCK NUTS & WASHERS**

- Border Bolt & Nut Lock Co., Richmond, Ind.  
("Border" bolt & nut lock & "Hobin" nut  
lock washers.)

# STAR AUTO LOCKS

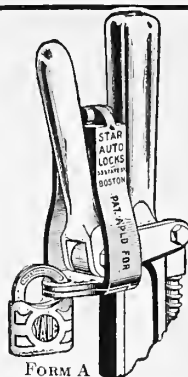
437 EXCHANGE BUILDING, BOSTON

**A locking device applied to the emergency or ratchet brake lever, providing effectively against accidental or unauthorized setting in motion of the car**

The only lock acknowledged to comply with the law, and affording as well a security against theft,—movement by mischievous persons,—or starting of a car on an incline.

The **Star Auto Locks** are covered by applications for patents, also controlling improved forms for future construction of the ratchet lever, whereby the release of the ratchet is variously prevented by locking devices on and along the lever itself.

**SIMPLE EFFECTIVE SECURE**



**Q** Our location in the **CAPITOL CITY** enables us to furnish a daily report of the New York State automobile registrations that surpasses all attempts. **A WEEK'S TRIAL GIVEN FREE, to PROVE our claims, at our expense.**

**OWNERS AUTO LIST COMPANY**  
CAPITOL STATION :: ALBANY, NEW YORK

## LOCK NUTS & WASHERS—Continued

- Breakstone, S., 1712 Michigan Ave., Chicago, Ill. "Edco." (Imported.)
- Columbia Nut & Bolt Co., Bridgeport, Conn. "Columbia." (Nut.)
- Eureka Nut Lock Co., 32nd & Smallman Sts. & A. V. R. R., Pittsburg, Pa. "Eureka." (Nuts.)
- Grip Nut Co., 575 Old Colony Bldg., Chicago, Ill. "Grip Nuts."
- Haskell, Wm. H. Mfg. Co., 451 Main St., Pawtucket, R. I.
- Hobbs Mfg. Co., Worcester, Mass. (Washers.)
- Hoffnung, S. & Co., Ltd., 116 Broad St., N. Y. City. "Fastnut." (Imported.)
- Jamesville Mfg. Co., Jamesville, N. Y. "Red-skin."
- La Buire Import Co., 123 W. 68th St., N. Y. City. (Washers.)
- National Lock Washer Co., 65 Johnson St., Newark, N. J. "National." (Washers.)
- ★National Tube Co., Frick Bldg., Pittsburg, Pa.
- Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich. (Nuts.)
- Positive Lock Washer Co., Newark, N. J. "Keystone." (Washers.)
- Western Tool & Forge Co., Brackenridge, Pa. (Nut locks.)

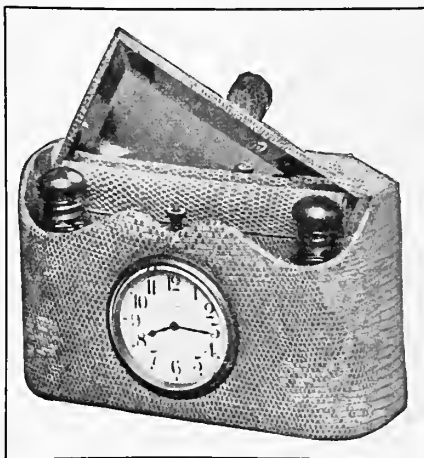
## LOCK SWITCHES

(See Switches.)

## LOCK VALVES

(See Gasoline Lock Valves.)

## Limousine Cases



We have facilities for making any style toilet cases



ESTABLISHED 1850.  
Correspondence Solicited.

**C. F. RUMPP & SONS**  
Fancy Leather Goods  
PHILADELPHIA

New York Salesroom, 683-685 Broadway

★ indicates Advertisers—see Index in back of book.

**LUBRICANTS**

(See "Oils," "Greases" &amp; "Graphite.")

**LUBRICATORS, Mechanical & Pressure**

- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.  
 American Lubricator Co., Detroit, Mich.  
 Biddison Mfg. Co., The, 1516 Williamson St., Madison, Wis. "High Duty."  
 Charter & Co., Hoopston, Ill. "Charter."  
 Detroit Lubricator Co., Detroit, Mich. "Detroit."  
 Eagle Glass & Mfg. Co., Wellsburg, W. Va. "Eagle." (Steel.)  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich. "Essex."  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Greene, Tweed & Co., 109 Duane St., N. Y. City. "Rochester."  
 Hall Mfg. Co., John & Gold Sts., N. Y. City.  
 ★Hancock Manufacturing Co., 776 E. Henry St., Charlotte, Mich. "Hancock." (Mechanical.)  
 Homer Brass Works, 231 Race St., Phila., Pa.  
 Hudson, Edmund, P. O. Box 728, Hartford, Conn.  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Industrial Instrument Co., Foxboro, Mass. "Standard."  
 Kinsey Mfg. Co., Toledo, O. "Kinwood."  
 Krahm Mfg. Co., Milwaukee, Wis. "Krahm."  
 Lavigne Mfg. Co., Commonwealth Ave & Railroad, Detroit, Mich. "Lavigne."  
 ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.  
 Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis.  
 Locke Regulator Co., Salem, Mass.  
 Lonergan, J. E. Co., 211-13 Race St., Phila., Pa.  
 Long Bros., Broadway & Buckeye St., Kokomo, Ind.  
 ★Lunkenheimer Co., The, Cincinnati, O. "Multiple," "Premier," "Paragon," "Mars" & "Vulcan."  
 McCanna Mfg. Co., 216 N. Jefferson St., Chicago, Ill. "McCanna."  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McCord."  
 Madison-Kipp Lubricator Co., Madison, Wis.  
 Manzel, Chas. W., 89-93 Main St., Buffalo, N. Y.  
 ★Manzel Bros. Co., 315-319 Babcock St., Buffalo, N. Y. "Manzel."  
 Michigan Lubricator Co., 661-671 Beaubien St., Detroit, Mich.  
 Neely Mfg. Co., Inc., 829-33 Wells St., Chicago, Ill.  
 Osgood, J. L. Lubricator Co., 121-138 Erie Co. Bank Bldg., Buffalo, N. Y.  
 Pedersen Mfg. Co., 636-644 First Ave., N. Y. City. "Pedersen."  
 Pioneer Iron Works, Antigo, Wis. "Morgan."  
 Precision Appliance Co., 2315 Austin Ave., Chicago, Ill. "Hill Precision."  
 Redington, F. B. Co., 112-114 S. Sangamon St., Chicago, Ill.  
 ★Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y. "Buffalo," "Hart" & "Sherwood."  
 Vogel, Wm. & Bros., 37 S. 9th St., Brooklyn, N. Y.  
 Westinghouse Air Brake Co., Pittsburgh, Pa. (For air compressors.)

**LUBRICATOR BELTS**

(See Belts, Fan, Pump &amp; Oiler.)

**LUGGAGE CARRIERS, AUTO**

(See Trunk Racks.)

**LUGGAGE CARRIERS, Cycle & Motor Cycle**

- Adams, Henry T. Co., 6823 S. Chicago Ave., Chicago, Ill. "Quick Action." (Motorcycle.)  
 Bradford Co., The, Delaware Ave. & Tatnall St., Wilmington, Del. "The Bradford."  
 Capitol Specialty Works, 147 Hudson Ave., Albany, N. Y. (Carrier & stand, motorcycle.)  
 Dow Wire & Iron Works, Louisville, Ky. (Cycle.)  
 ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Excelsior." (Carrier & stand, motorcycle.)  
 ★Goodrich, B. F. Co., Akron, Ohio. (Rubber, cycle.)  
 Majestic Mfg. Co., Worcester, Mass. "Majestic." (Wire cycle carrier & tubular, motorcycle.)  
 Motorcycle Specialty Co., The, 258 Columbus Ave., Boston, Mass. (Motorcycle handlebar; also combined with stand.)  
 ★New York Sporting Goods Co., 15-17 Warren St., N. Y. City. "Janette." (Cycle.)  
 ★Reading Standard Co., Reading, Pa. "R-S."  
 Swensen, B. A., 298 Blackstone St., Cor. Prairie Ave., Providence, R. I. "Swenson." (Motorcycle.)  
 Widmayer, F. B. Co., 2312 Broadway, N. Y. City. "Widmayer." (Combined motorcycle stand & luggage carrier.)

**LUGS, Tire**

(See Tire Lugs.)

**LUMBER, Auto Body**

- Anderson-Tully Co., Memphis, Tenn. (Band sawn hardwood, cottonwood, veneers, etc.)  
 Darling, J. W. Lumber Co., Cincinnati, Ohio. (Cottonwood & red gum.)  
 Eggers, F. Veneer Seating Co., Two Rivers, Wis. (Wood for auto bodies.)  
 Gardner Artificial Lumber Co., 115 Broadway, N. Y. City. "Gardner." (Artificial.)  
 Hartwell & Neely Co., Chicago Heights, Ill. (Hickory strips for wheel rims, hickory billets for wheel spokes & ash for frame work.)  
 Lamb-Fisk Lumber Co., 718-25 Memphis Trust Bldg., Memphis, Tenn. (Oak, ash, gum, cottonwood & hickory.)  
 Love, Boyd & Co., Nashville, Tenn. (Hickory & poplar.)  
 Luehrmann, Chas. F. Hardwood Lumber Co., St. Louis, Mo.  
 Marshall, William L., 429-433 E. 10th St., N. Y. City. (Fine woods & veneers.)  
 Moore & McFerren, Memphis, Tenn. (Cottonwood, gum, oak & ash.)  
 Paepcke-Leicht Lumber Co., W. Chicago Ave. & Sangamon St., Chicago, Ill. (Cottonwood, ash, sap gum, red gum, oak, etc.)  
 Shearer, Saml. H., 1420 Chestnut St., Phila., Pa. (Oak & ash.)  
 Shiels, Chas. F. & Co., Cincinnati, O. (Body & wind shield lumber.)

★ indicates Advertisers—see Index in back of book.

**LUMBER, Auto Body—Continued**

Thompson, J. W. Lumber Co., Memphis, Tenn.  
(Oak, ash, poplar, cottonwood, satin &  
black walnut.)  
Winchester Lumber Co., Winchester, O.

**LUMBER, Hull and Decking**

Shiels, Chas. F. & Co., Cincinnati, O.

**MACHINE WORK, To Order**

(See also Contract Work.)

- Acme Oil Engine Co., Union Ave., near R. R.,  
Bridgeport, Conn. (To order.)  
★Acme Universal Joint & Mfg. Co., 310-11 E.  
Water St., Kalamazoo, Mich.  
Acorn Brass Mfg. Co., 227 N. Peoria St., Chi-  
cago, Ill. (And brass finishing.)  
Adjustable Collet Co., The, 211 High Ave.,  
Cleveland, O.  
Aetna Brass Mfg. Co., The, 4800-4810 Hamil-  
ton Ave., Cleveland, O.  
Alexander & Cox Co., Ogden & Western Aves.,  
Chicago, Ill.  
American Gear & Mfg. Co., Jackson, Mich.  
Ashley Machine Works, 714 University Ave.,  
Rochester, N. Y.  
Atkins, E. C. & Co., Indianapolis, Ind.  
Atlas Mfg. Co., Fostoria, Ohio. (On crank  
shafts.)  
Attwood Brass Works, 18-20 Bowery St.,  
Grand Rapids, Mich.  
Auto Parts Mfg. Co., 1359-79 St. Antoine St.,  
Detroit, Mich.  
Bettcher Mfg. Co., Cleveland, O.  
Blair Tool & Machine Works, 24-27 West St.,  
N. Y. City.  
Blanchard Machine Co., 64 State St., Cam-  
bridge, Mass.  
Bultman, The F. H. Co., 2108 Superior Ave.,  
N. W., Cleveland, O.  
Cassady-Fairbank Mfg. Co., The, 6106-6130 La  
Salle St., Chicago, Ill.  
Clark Novelty Co., 380 Exchange St., Roches-  
ter, N. Y.  
Cleveland Galvanizing Works Co., 18-24 Cooper  
St., Cleveland, O.  
Columbian Hardware Co., Cleveland, O.  
Columbus Screw & Machine Co., The, 244  
Kaiser St., Columbus, O.  
Cross Gear & Engine Co., 800-806 Bellevue  
Ave., Detroit, Mich.  
Cummings Machine Co., 110 High St., Boston,  
Mass.  
Detroit Auto Specialty Co., 909 Greenwood  
Ave., Detroit, Mich.  
Driggs-Seabury Ordnance Corporation, Shar-  
on, Pa.  
★Dunlap Engineering Co., The, Columbus, O.  
Eastern Machine & Stamping Co., 115 Wicken-  
den St., Providence, R. I.  
Easton Machine Co., South Easton, Mass.  
(Broaching & key-way cutting.)  
Elkhart Brass Mfg. Co., 908 Prospect St., Elk-  
hart, Ind. (Special.)  
Ellis Mfg. Co., The, Milldale, Conn.  
Ferro Machine & Foundry Co., The, Wade  
Bldg., Cleveland, O.  
Fort Dearborn Mfg. Co., 1574-80 Crossing St.,  
Chicago, Ill.  
Fowler Brass Works, Inc., The, 2333-35 Wa-  
bash Ave., Chicago, Ill.  
Fries & Co., 91 Main St., Buffalo, N. Y.  
Frontier Engineering Co., 816-36 Fort St., W.,  
Detroit, Mich.  
Funk Engineering Co., 39-47 Fourteenth St.,  
Hoboken, N. J.  
Gabel-Hill Co., The, 121-125 Alexander St.,  
Rochester, N. Y.  
Gilliam Mfg. Co., The, Canton, O.  
Granse-McCormick Machine Co., 223 North  
Niagara St., Saginaw, W. S., Mich.  
Harrington-Wiard Co., Lieb & Wight Sts.,  
Detroit, Mich.  
Haydenville Co., The, Haydenville, Mass.  
Homer Brass Works, 231 Race St., Phila., Pa.  
★Imperial Brass Mfg. Co., The, 441 S. Jefferson  
St., Chicago, Ill. (Brass work & finish-  
ing.)  
Ingle Machine Co., 299-303 St. Paul St., Ro-  
chester, N. Y.  
Ireland & Matthews Mfg. Co., Detroit, Mich.  
Jackson-Church-Wilcox Co., 512 N. Hamilton  
St., Saginaw, Mich. (Contract.)  
Jann & Shank Mfg. Co., 617-31 W. Jackson  
Blvd., Chicago, Ill.  
Johnston & Jennings Co., 877 Addison Rd.,  
Cleveland, O.  
Keeler Brass Co., Grand Rapids, Mich.  
Kennedy Valve Mfg. Co., Elmira, N. Y.  
Konigslow, Otto Mfg. Co., Central Ave. & C.  
& P. R. R., Cleveland, O.  
Krahn Mfg. Co., Milwaukee, Wis.  
Leland, W. H. & Co., Worcester, Mass. (On  
crankshafts.)  
Lovell, F. H. & Co., Arlington, N. J.  
M. A. N. Mfg. Co., 257 W. Exchange St.,  
Providence, R. I.  
★McCord Mfg. Co., 2587 E. Grand Blvd., De-  
troit, Mich.  
Mammoth Mfg. Co., White Plains, N. Y.  
Manufacturers Foundry Co., The, Waterbury,  
Conn. (On grey iron motors.)  
Manufacturers & Inventors Electric Co., 82-84  
Nassau St., N. Y. City.  
Manville Bros. Co., Waterbury, Conn. (On cyl-  
inders & pistons.)  
Mason, Wm. H., Mt. Carmel, Ill.  
Meisel Press & Mfg. Co., 944 Dorchester Ave.,  
Boston, Mass.  
★Michigan Automobile Co., Ltd., Kalamazoo,  
Mich.  
Michigan Auto Parts Co., 1559-1561 Jefferson  
Ave., W., Detroit, Mich.  
★Michigan Crank Shaft Co., Muskegon, Mich.  
(On crank shafts.)  
Moore & Co., Indiana & Franklin Sts., Chi-  
cago, Ill.  
Muelhauser Machine Co., The, Cleveland, O.  
National Cycle Mfg. Co., Bay City, Mich.  
National Engineering Co., Saginaw, Mich.  
Nilson-Miller Co., 13th & Hudson Sts., Hobo-  
ken, N. J. (Cylinder boring.)  
★Northern Engineering Works, Chene & At-  
water Sts., Detroit, Mich.  
★Oberdorfer, M. L. Brass Co., 804-808 E. Wa-  
ter St., Syracuse, N. Y.  
Odel & Koto Machine Co., 642 Race St., Beloit,  
Wis.  
★Ohio Brass Co., Mansfield, O. (To order.)  
Perfection Mfg. Co., 939 Stewart Ave., Cleve-  
land, O.  
★Pioneer Brass Works, 418-24 S. Pennsylvania  
St., Indianapolis, Ind.  
Pollard Engineering Co., 165-169 N. Jefferson  
St., Chicago, Ill.  
Prentice, Geo. G. & Co., Lenox & Quinnipiac  
Aves., New Haven, Conn.  
Providence Engineering Works, 521 S. Main  
St., Providence, R. I.  
Puritan Machine Co., 72-74 Brush St., E., De-  
troit, Mich.  
Redington, F. B. Co., 112-114 S. Sangamon St.,  
Chicago, Ill.  
Reeves Bros. Co., Alliance, O.  
Rutter, Arthur T. & Co., 256 Broadway, N. Y.  
City.  
Sayre Stamping Co., Sayre, Pa.  
Schaal, W. R. Tool & Machine Works, Grand  
Central Market Bldg., Harrison & Loomis  
Sts., Chicago, Ill. (Contract.)

★ indicates Advertisers—see Index in back of book.



**MACHINE WORK, To Order—Continued**

- ★Sier-Bath Co., 143 W. 54th St., N. Y. City.
- Snow, B. W. Co., The, 132 Bissell St., Syracuse, N. Y.
- ★Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
- Standard Brass & Iron Works, 1820 St. Paul Ave., Milwaukee, Wis.
- Sterling Machine & Stamping Co., Wellington, Ohio.
- Throop Perforating Co., 80 Terrace, Buffalo, N. Y. (To order.)
- Troeger, G. E. Mfg. Co., 7280-84 S. Chicago Ave., Chicago, Ill.
- Universal Machinery Co., 1916 St. Paul Ave., Milwaukee, Wis.
- Victor Tool Co., Waynesboro, Pa. (On crank shafts.)
- Wade Machine Co., 287 Atlantic Ave., Boston, Mass.
- Webster & Perks Tool Co., Springfield, Mass. (Special jig and tool work.)
- Woods Engineering Co., The, Alliance, Ohio. (On contract.)
- Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass.
- Wright, L. Machine Works, 9-15 Alling St., Newark, N. J.

**MAGNETIC SPARK PLUGS**

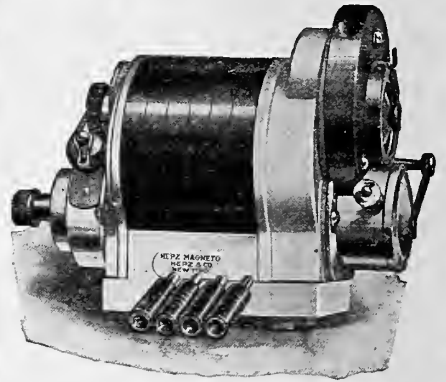
- Nilmellor Electrical Co., 1789 Broadway, N. Y. City. (Imported.)
- Orswell Ignition Co., 29 Haverhill St., Boston, Mass. "Orswell."

**MAGNETOS, IGNITION**

- Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.
- ★Bosch Magneto Co., 223-225 W. 46th St., N. Y. City. "Bosch."
- Bretz, J. S. Co., Times Bldg., N. Y. City. "Unterberg & Helmle." (Imported.)
- Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich.
- ★Buffalo Ignition Co., 41-43 East Eagle St., Buffalo, N. Y. "Volta."
- Carlisle & Finch Co., 229 E. Clifton Ave., Cincinnati, O.
- Champion Co., The, 36 Whittier St., Boston, Mass. "Champion."
- Champion Ignition Co., Flint, Mich.
- Connecticut Telephone & Electric, 50 Britannia St., Meriden, Conn. "Connecticut."
- D. K. Electric Co., 211-213 Chestnut St., St. Louis, Mo. "Duncan."
- Dow Mfg. Co., The, 131 Adams Sts., Braintree, Mass. "Dow."
- Duncan Electric Mfg. Co., LaFayette, Ind.
- Duplex Coil Co., The, Fond du Lac, Wis. "Duplex."
- Economy Mfg. Co., The, Park Bldg., Pittsburgh, Pa. "Perfection."
- Eisemann Magneto Co., The, 225-227 W. 57th St., N. Y. City. "Eisemann."
- Engineering Specialty Co., Stamford, Conn.
- Fawn River Mfg. Co., Constantine, Mich. "Fawn."
- Fisher Mfg. Co., South Bend, Ind. "Fisher."

If it's the  
**FAT HOT ARC FLAME**  
you're after, choose the

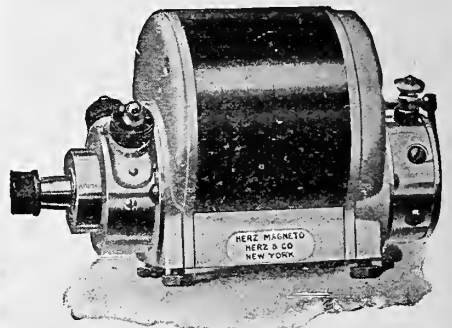
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MAGNETO**



that self-contained high-tension Magneto they all talk about. No coils, no dangling wires—just Magneto and plugs.

THE  
**HERZ  
MAGNETO**

is made for the largest touring-car as well as the smallest motorcycle. 15,000 motorcycles are using the "Herz" in 1910.

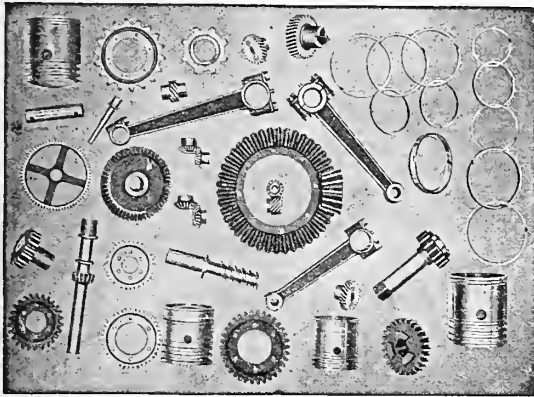


Insist upon the "Herz" on your car and be done with ignition trouble thereafter. Write us.

**HERZ & CO., 295 Lafayette St., New York**

See our ad., page 342.

# ATTENTION! Motor Car Builders!



## Manufacturing Details Relieved Product Improved

We specialize in the production of machine parts, such as

**Pistons, Piston Rings,  
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Parts.**

All to your specifications where required. We offer you a better product at a consistent price and help you out with your manufacturing details.

Try us on Helical Cut Motor Gears and let us solve the motor gear problem for you.

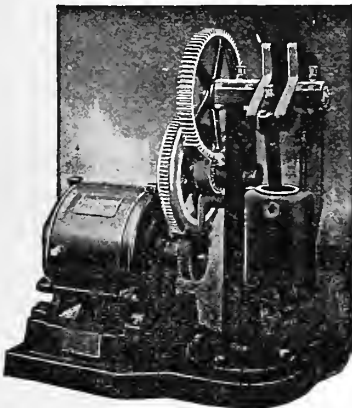


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Our improved system of die casting and the use of only the highest grades of bearing metals enables us to offer you a die cast bearing proposition of superior merit.

We furnish die cast bearing bushings to your specifications in any of the high-grade motor babbits or Genuine Parsons White Brass.

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Designed especially for garage use, our line of Belt and Motor Driven Air Compressors, for tire inflating and cleaning purposes, lighten labor in the garage and save you money. Single and Three cylinder styles.

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INDIANAPOLIS, IND.**

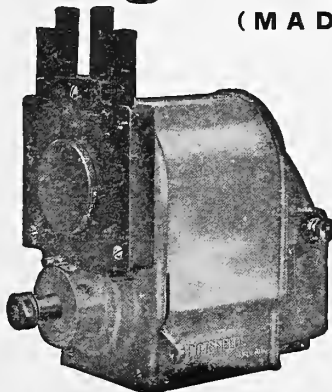
**MAGNETOS, Ignition—Continued**

- ★General Electric Co., Schenectady, N. Y. "G. E."  
Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I.  
Guarantee Tire & Rubber Co., The, 208-210 S. Illinois St., Indianapolis, Ind. "Long Distance."  
★Heinze Electric Co., Lowell, Mass. "Heinze."  
Henricks Novelty Co., 124-128 Capitol Ave., S., Indianapolis, Ind. "Eureka."  
★Hercules Electric Co., 2128-2136 Northwestern Ave., Indianapolis, Ind. "Star," "Wizard" & "Kurtz."  
★Herz & Co., 203-205 Lafayette St., N. Y. City. "Hagen." (Imported.)  
★Hess-Bright Mfg. Co., The, 2102 Fairmount Ave., Phila., Pa. "Hess-Bright." ("Taurus," imported.)  
★Holtzer-Cabot Electric Co., The, Boston, Mass. "H-C."  
Igniter Appliance Co., The, 302 Electric Bldg., Cleveland, O. "Hotshot."  
★K-W Ignition Co., The, 40 Power Ave., Cleveland, O. "K-W."  
Knoblock-Heideman Co., The, South Bend, Ind. "Quick Action."  
Kokomo Electric Co., The, Kokomo, Ind. "Kingston."  
★Lehman, J. H. Mfg. Co., 500 5th Ave., N. Y. City. "Fulmina." (Imported.)  
★Lutz-Lockwood Mfg. Co., The, Aldene, N. J. "SX."  
Marburg, Theo. H., Room 12, 59 Wall St., N. Y. City. "Mea." (Imported.)  
★Mavity-Sleeper Co., Fowler, Ind. "M. & S."  
Menominee Electric Mfg. Co., Menominee, Mich.  
Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radium."  
★Motsinger Device Mfg. Co., Pendleton, Ind. "Motsinger."  
National Coil Co., 412 Michigan Ave., E., Lansing, Mich.  
National Steel Products Co., The, Lorain, O. "Ben Franklin."  
Nilmelior Electrical Co., 1789 Broadway, N. Y. City. (Imported.)  
Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. "Record."  
O'Brien Electrophone Co., Inc., Hallowell, Me.  
Osburn Electric Co., 66 Fort St., E., Detroit, Mich. "Osburn."  
★Pfanstiehl Electrical Laboratory, N. Chicago, Ill.  
Philadelphia Timer & Machine Co., 328 Vine St., Phila., Pa. "Velos."  
★Pittsfield Spark Coil Co., Dalton, Mass. "Pittsfield."  
★Reliable Electric Mfg. Co., 419 W. South St., Indianapolis, Ind. "Reliable."  
★Remy Electric Co., Columbus Ave. & 25th St., Anderson, Ind. "Remy."  
★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal.  
Simms Magneto Co., 1780 Broadway, N. Y. City. "Simms." (Magnetos.)  
★Splittorf, C. F., 261-265 Walton Ave., N. Y. City. "Splittorf."  
Sumter Telephone Mfg. Co., The, Sumter, S. C. "Sumter."  
Tritt Electric Co., The, Union City, Ind. "Peerless" & "Vim."  
Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.  
Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill. "Vesta."  
Webster Electric Co., 1645 Old Colony Bldg., Chicago, Ill. "Webster-Milton."  
Western Electric Co., The, 465 West St., New York, N. Y. "Hawthorne."  
Wende & Co., 350-52 Wabash Ave., Chicago, Ill. "Swiss Komet." (Imported.)  
Wheeler & Schebler, Shelby, Barth & Sanders Sts., Indianapolis, Ind. "W. & S."

# 1910 PITTSFIELD 1910

## High Tension Magnetos

(MADE IN AMERICA)



The man who uses a PITTSFIELD SYSTEM never gets in a tight place and sticks there for want of sufficient power from his motor. Any good motor can furnish the power if the mixture is properly ignited.

The PITTSFIELD MAGNETO gives the maximum efficiency of the fuel, the full power of the motor and increases the snap of the engine a hundred per cent.

One-quarter turn of the crank with the timing lever fully retarded starts the motor equipped with a PITTSFIELD MAGNETO. Perfect timing is assured through the absence of small and delicate parts in the Distributor. Absence of coil troubles is obtained, since there are no moving wires. Primary and Secondary currents generated in stationary coils.



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All Pittsfield Systems are Trouble Proof. Write for Details.

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*A full line of "Pittsfield" goods on sale by H. V. Greenwood, 166 Lake Street, Chicago*

# Do You Want a Guess or a Certainty?

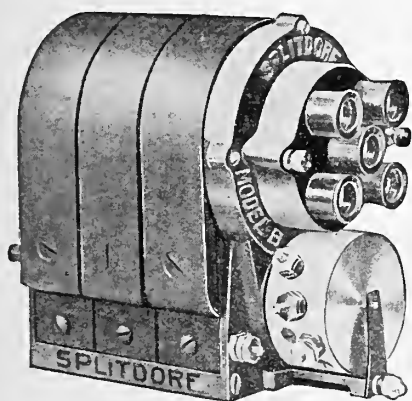
The growing popularity of Magneto Ignition has caused many new and untried Magnetos to appear on the market.

On the other hand, the remarkable Efficiency and Reliability of the long used

## SPLITDORF MAGNETO

has been so fully and so frequently shown in numberless endurance tests—many of them severe beyond belief—that the leading authorities in motordom give it

### First Place in the Ignition Field



Model B Magneto

Why not equip your car with a Magneto that has stood the test of time and has made good? One whose high merit is daily winning many new friends?

With a SPLITDORF on your car all ignition troubles disappear and Perfect Ignition is an Absolute Certainty.

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**MAGNETOS, Ignition—Continued**

- Whelchel Electric Co., The, Third & John Sts., Anderson, Ind.  
 Whisler Mfg. Co., Port Huron, Mich. "Whisler."  
 Witherbee Igniter Co., Springfield, Mass. "Wico." (Igniters.)

**MAGNETS**

- Esterline Co., The, 112 W. Main St., LaFayette, Ind.  
 Sangamo Electric Co., Springfield, Ill.

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- American Hard Rubber Co., N. Y. City.  
 Stokes, Jos. Rubber Co., Trenton, N. J.

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- A-Z Co., 527-29 W. 56th St., N. Y. City.  
 Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass.  
 Detroit Motor Castings Co., 299-303 Beaufait Ave., Detroit, Mich. (Gasoline & water.)  
 Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich. (Exhaust pipes.)  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. (Water pipes.)  
 National Pipe Bending Co., New Haven, Conn. (Exhaust, inlet & water manifolds, to order.)  
 National Welding & Mfg. Co., 1422-30 Niagara St., Buffalo, N. Y. (Steel exhaust manifolds.)  
 North Tonawanda Musical Instrument Works, North Tonawanda, N. Y.  
 Nugent, W. H., 775 Third Ave., Brooklyn, N. Y. (Inlet & exhaust pipes.)  
 Paragon Auto Parts Co., The, 1709-1711 Broadway, N. Y. City.  
 Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City. (Fuel & water piping.)  
 Rome-Turney Radiator Co., Rome, N. Y. (Seamless brass & copper intake & exhaust manifolds.)  
 Standard Metalwork Co., Thompsonville, Conn. (Intake & exhaust pipes & water pipes.)  
 Tube Bending Machine Co., 148-150 Mulberry St., Newark, N. J.  
 Whitlock Coll Pipe Co., The, Hartford, Conn. (Water & gas manifolds & piping.)

**MANUFACTURERS' SALES AGENTS**

- Ainsworth, H. B., 412 N. Franklin St., Madison, Wis. "Eclipse." (Marine motors.)  
 Alcohol Utilities Co., The, 156 W. 23rd St., N. Y. City. (Taylor Instrument Companies & U. S. Industrial Alcohol Co.)  
 American Distributing Co., Jackson, Mich. (Axles, wheels, steering gears & pressed metal parts.)  
 ★American Stepney Spare Wheel Co., 1773 Broadway, N. Y. City. (Stepney wheels & automobile & motorcycle rims.)  
 Asch, B. M., 1779 Broadway, N. Y. City. (Miller & Starr, Austro-American Separator Co., Whalen Lock Co., Eames Mfg. Co., Page Storms Drop Forge Co., Kennedy (Ideal) Carburetor Co.)  
 ★Atlas Auto Supply Co., 830-36 E. 43rd St., Chicago, Ill. (Ajax-Grieb Rubber Co.)  
 Autogenous Welding Equipment Co., 92 Hayden Ave., Springfield, Mass. (Davis-Bournonville Co., United Oxygen & Chemical Co.)  
 Auto Jack Distributing Co., Cincinnati, Ohio. (Haslup Motor Jack Co.)  
 Auto Supply Co., Inc., 1733-37 Broadway, N. Y. City. (Smooth-on Mfg. Co.)  
 Baker, W. E. & Co., 1779 Broadway, N. Y. City.  
 Barrett, M. L. & Co., 219 Lake St., Chicago, Ill. (Denatured & wood alcohol.)  
 Bean, Sidney A., New Rochelle, N. Y. (Auto-coil Co.)  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. (Pfanstiehl Electrical Co., Vestal Accumulator Co., Globe Machine & Stamping Co., Wm. M. Crane Co., J. B. Carroll Corp., Standard Tool Co., Hoyt Electrical Instrument Co., Imperial Brass Mfg. Co., F. H. Lawrence Co. & Delta Mfg. Co.)  
 Bolton, Geo. W., 260 Wrexford Ave., Detroit, Mich. (Auto & motor boat specialties.)  
 Brandenburg & Co., Thoroughfare Bldg., N. Y. City. (Lavigne Mfg. Co., Kellogg Mfg. Co., Reading Metal Body Co., Milwaukee Motor Co., Universal Storage Battery Co., Hoffman Mfg. Co., England—steel balls, Excelsior Supply Co.—gasoline auto engines.)  
 Breakstone, S., 1712 Michigan Ave., Chicago, Ill. (Windsor Mfg. Co., Dickinson Distributing Co., U. J. Ulery Co., Chas. Cotta Victor Clutch Compound Co., Hagstrom Bros. Mfg. Co., Auto Accessories Mfg. Co., Recometre Co. of America, Perry Chain Grip Co. & B. Morgan.)  
 Bretz, J. S. Co., Times Bldg., N. Y. City. (Hartford Universal joints & pressed steel auto parts.)  
 Briggs, W. M., 136 Liberty St., N. Y. City. (Joyce Cridland Co. & Rock Island Mfg. Co.)  
 Butts & Ordway Co., 33 Purchase St., Boston, Mass. (Auto-Tire Vulcanizing Co., Whitaker Chain Tread Co., A. L. A. M. taps & dies, auto turn tables & trunk racks.)  
 ★C. & C. Co., The, 162 Main St., Auburn, Me. (Field Radiator & Boiler Compound Co.)  
 Car Makers Selling Co., 1256 Michigan Ave., Chicago, Ill. (Anhut Motor Car Co., De Tangle Motors Co., & The Weyher Mfg. Co.)  
 Carpenter-Morton Co., Boston, Mass. (For New England, for "Mander's" English varnishes.)  
 ★Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y. (Barnes Gear Co. & Noye Mfg. Co.)  
 Cleveland Tool & Supply Co., The, Cleveland, Ohio. (National Tube Co.)  
 Connell, W. J., 36 Columbus Ave., Boston, Mass. (Wheeler & Schebler, Edmunds & Jones Mfg. Co., Victor Tire Traction Co., Elite Mfg. Co. & Pittsfield Spark Coil Co.)  
 ★Cross, Frank H. Distributing Co., 1777-79 Broadway, N. Y. City. (Hofacker Mfg. &

**MANUFACTURERS' SALES AGENTS—Continued**

- Supply Co., Nathan Novelty Mfg. Co., Hagen Brown Co., National Motor Supply Co.)
- Cryder & Co., 583 Park Ave., N. Y. City. "Ronson." (Wrenches.)
- Dallas, A. C. & Son, 36 La Salle St., Chicago, Ill. (Brass, copper, bronze & aluminum seamless tubing.)
- Deppeler, The J. H. Co., 819 Jersey Ave., Jersey City, N. J. "Beltzer-Delcampe." (Oxy-acetylene welding & cutting apparatus; U. S.)
- Doggett, Stanley, 101 Beekman St., N. Y. City. (Flake & powdered graphite, "Perfection" parting & facing compounds, Ferro-Silicon & Ferro-manganese, iron cement & "Perfection" bronze & brass flux for foundry use & soapstone for tires.)
- Downing, Chas. J., 1777 Broadway, N. Y. City. (Regal Lamp & Horn Co., Hagstrom Bros. Mfg. Co., Standard Metal Mfg. Co., Shawver Co., Thos. Harper, National Valgrinok Co., Enterprise Chain Co., & B. & L. Autolamp Co.)
- Driggs, L. L. & Co., 90 West St., N. Y. City. (United Steel Co.)
- Dunn Machinery Co., Atlanta, Ga. ("All Right" spark plugs, "Atlanta" dry cells, "Ferro" motors, spark coils, copper tubing, air compressors, propellers, reverse gears & "Mullin's" steel bolts.)
- Eagye-Troutman Co., 1712 Michigan Ave., Chicago, Ill. (P. H. Brodessor & Co.)
- Economy Cycle Supply Co., Detroit, Mich. (Harley-Davidson Motor Co.)
- Eisner, Harry & Co., 29 Scotia St., Boston, Mass. (Yankee Muffler Co., Geiszler Bros., Standard Sales Co., & Empire Sales Co.)
- Electrical Maintenance & Repair Co., 200-202 Market St., Newark, N. J. (Reinhold No Flux Aluminum Solder Co.)
- Enterprise Supply Co., The, 501 Commercial National Bank Bldg., Chicago, Ill. "Hepco." (Auto paints & varnishes.)
- Erie Rubber Co., Erie, Pa. (Continental Rubber Works & Boston Woven Hose & Rubber Co.)
- Factory Sales Corporation, 1438 Michigan Ave., Chicago, Ill. (Wheeler & Schebler, Quincy-Manchester-Sargeant Co., Reading Steel Casting Co., New York Coil Co., & "Pyramid" aluminum floor covering.)
- Fenstermacher, O., 311 S. Fifth St., Minneapolis, Minn. (Firestone Tire & Rubber Co., Fowler Lamp & Mfg. Co., Alfred C. Stewart Machine Works, Hagstrom Bros. Mfg. Co., Dow Tire Co., Douglas & Lomason & Earl Automatic Wind Shield Co.)
- Forbes, Walter J., 70 Long Wharf, Boston, Mass. (D. M. Tuttle Co., Grand Rapids Gas Engine & Yacht Co., K-W Ignition factory & auto garage supplies.)
- Frasse, Peter & Co., 130-32 Worth St., N. Y. City. (Shelby steel tubing, tools & factory & garage supplies.)
- Frey, John W., 722 Main St., Buffalo, N. Y. (Connecticut Tel. & Elec. Co., C. A. Mezger, & Emil Grossman Co.)
- Fulton-Zinke Co., 1256 Michigan Blvd., Chicago, Ill. (Victor Lamp Co., Duplex Coil Co., Jeffery-Jewitt Co., Standard Underground Cable Co., Sommer Motor Co., Multi-Unit Gas Engine Co., Sterling Machine & Stamping Co., Armiger Chemical Co., Manhattan Electrical Supply Co., Hall Storage Battery Co., Lockport Stamping Co., McCanna Mfg. Co.)
- Gasser, Wm. J., 136 Liberty St., N. Y. City. (Metal polish.)
- Gerdelman, Benj. Mfg. Co., 4630 Olive St., St. Louis, Mo. (Havoline Oil Co., Witherbee Igniter Co., Gray & Davis & Auto-Automatic Wind Shield Co.)
- ★Gibney, J. L. & Bro., 215-17 N. Broad St., Phila., Pa. (Continental Caoutchouc Co.)
- Gibson, Hugo C., 630 West 135th St., N. Y. City. (Compression & explosion indicator, "Hospitalier Manograph.")
- Grady, J. W. & Co., 68 High St., Worcester, Mass. ("Hudson" bicycles, "Royal Pioneer" motorcycles, "Bennett" pedals, "Penn" & "Wearwell" grips, "New England" tires & bicycles.)
- Graham, John H. & Co., 113 Chambers St., New York, N. Y. ("Many Use" Oil, Coes Wrench Co., C. T. Ham Mfg. Co.)
- Green, A. M. & Co., 1686 Broadway, N. Y. City. (Uncas Specialty Co., K-W Ignition Co., F. E. Bowers Co.)
- ★Hardy, R. E. Co., The, 201 37th St., Brooklyn, N. Y. (Chassis, transmissions & differentials.)
- Hastings & Anderson, 45 & 47 Lake St., Chicago, Ill. (Mossberg wrenches, Jacobsen air compressors & steel balls.)
- Hatch, D. F., Box 143, Denver, Colo. (Auto Time Saver Repair Kit Co.)
- Hayne-Surridge Auto Goods Co., 1017 Lucas Ave., St. Louis, Mo. ("Pierce" auto leather pillows & "Tannate" leather fan belt-ing.)
- Henderson Motor Sales Co., Indianapolis, Ind. (Colt Motor Car Co.)
- Hibbard Engineering Co., 872 Woodward Ave., Detroit, Mich. (Heinze Elec. Co., Thermoid Rubber Co., & Lumen Bearing Co.)
- Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. (Auto parts & supplies.)
- ★Hopewell Bros., 42 Osborn St., Cambridge, Mass. ("Raybestos" brake lining, in New England.)
- House, J. S., 18 Bass Block, Ft. Wayne, Ind. (G. W. Millikan Bow Factory.)
- Hutton, W. E., 350 Fulton St., Brooklyn, N. Y. (Anderson Spark Plug Co.)
- Indiana Motor Sales Co., 505 Odd Fellows' Bldg., Indianapolis, Ind. (Indiana Motor & Mfg. Co., Franklin, Ind.)
- ★Kasner, A. H., 152 Church St., N. Y. City. Kennedy, Willing & Co., 524 Arch St., Phila., Pa. (Auto topping & trimmings.)
- Klaxon Co., The, 1 Madison Ave., N. Y. City. (Klaxon warning signals in U. S.)
- ★Koehler, The H. J. Co., 1709 Broadway, N. Y. City. (Rider-Lewis Motor Car Co., & Hupp Motor Car Co.)
- Lackawanna Mfg. Co., Newburgh, N. Y. (Hydrex Silent Exhaust Works, Dansville, N. Y.)
- Leavitt, C. W. & Co., Cortlandt Bldg., 30 Church St., N. Y. City. (Ores, metals & alloys.)
- Leavitt, J. W. & Co., San Francisco, Cal. (Reo, Stoddard-Dayton, Overland & Marion automobiles.)
- Leng's, John S. Sons & Co., 33 Murray St., N. Y. City. (Weldless Steel Tube Co., Birmingham, Eng.)
- Loring Auto Appliance Co., 42 W. 43rd St., N. Y. City.
- Majestic Mfg. Co., Worcester, Mass. "Persons." (Belt fasteners.)
- Marion Motor Car Sales Co., Indianapolis, Ind. (Marion Automobile & Mfg. Co.)
- Mather, The C. B. Corporation, Newburyport, Mass. (Marine motors & accessories.)
- Meixell-Downing Company, 505 Odd Fellows' Bldg., Indianapolis, Ind. (Clark Motor Car Co.)
- Merriam, Arthur H., 132 Pearl St., N. Y. City. (Drake Acetylene Burner Supply Co.)
- Moore Motor Supply Co., Golden Gate & Van Ness Aves., San Francisco, Cal. (Columbia Lubricants Co.)
- Morris, E. K. & Co., 311-17 W. 2nd St., Cincinnati, O. (Chrome nickel steel & seamless steel tubing.)
- ★Mossberg, Frank Co., Attleboro, Mass. ("Auto-Cle" & "Titus Cle" wrenches.)

**MANUFACTURERS' SALES AGENTS—Continued**

- Motch & Merryweather Machinery Co., The, 707-715 Lakeside Ave., N. W., Cleveland, Ohio. (Valve grinder.)
- Motor Requisites Co. (Smalley Daniels, Mgr.), 23 Motor Mart, Boston, Mass. (Globe Machine & Stamping Co., Saxon Lamp Co., Attwood Brass Works, Byrne-Kingston Co., Kokomo Electric Co., Union Battery Co., & Perfection Mfg. Co.)
- Motor Supply Agency Co., The, 1246 Euclid Ave., Cleveland, O. (Horsey Mfg. Co., Empire Tire Co., Stewart & Clark Mfg. Co., Kitsee Storage Battery Co., Enterprise Chain Co., Havoline Oil Co., Kamlee Trunk Co.)
- Mutual Auto Accessories Co., The, 1937 Broadway, N. Y. City. ("C. G. V." oil and grease, "Skiddo" metal & body polish, "Victor" shock absorber.)
- National Sales Corporation, 232 W. 58th St., N. Y. City. (Theodore Kundtz & Emil Grossman Co.)
- New Amsterdam Motor Co., 152 W. 56th St., N. Y. City. (Crawford Automobile Co.)
- New York Motor Boat Co., City Island, N. Y. (D. M. Tuttle Co., Anderson Engine Co.)
- ★New York Sporting Goods Co., 15-17 Warren St., N. Y. City. (Stag Rubber Co., & Miami Cycle & Mfg. Co.)
- New York Transportation Co., 49th St. & 8th Ave., New York City. (Exide batteries, in New York & vicinity.)
- Nicholls, Wm. S., 253 Broadway, N. Y. City. ("Standard" stationary engines, "Dayton" power hammers, "Anderson" electric grinders, electric breast drills & "Economizer" stationary gasoline engines.)
- Norvell, Shapleigh & Co., St. Louis, Mo. "P. & H." (Tires.)
- Overland Sales Co., The, 2224-28 Michigan Ave., Chicago, Ill. (Vivax Storage Battery Co., Harder Mfg. Co., Findeisen & Kropf Mfg. Co., Chicago Auto Lamp Works, Fowler Lamp & Mfg. Co., Detroit Steering Wheel & Wind Shield Co., The Sawyer Co., Milwaukee Auto Engine & Supply Co., Hopewell Bros., No-Shammy Co., Metal Specialties Co., Allen Specialties Co., Reliable Non-Skid Chain Co., Eldredge Mfg. Co.)
- Owen, R. M. & Co., Lansing, Mich. (Reo Motor Car Co., Premier Motor Mfg. Co.)
- Pacific Sales Corporation, 50-56 Van Ness Ave., San Francisco, Cal. (Apple Electric Co., Barco Brass & Joint Co., Emil Grossman Co., International Metal Polish Co., Perfection Non-Skid Climber Co., Rutherford Rubber Co., Hagstrom Bros. Mfg. Co., Rex Wrench Co., Saxon Lamp Co., Sommer Motor Co., Tokheim Mfg. Co., Star Speedometer Co., & Coventry Chain Co.)
- Pagel-Allen Auto Co., 1407 Hennepin Ave., Minneapolis, Minn. (Schacht Mfg. Co., & Demot Car Co.)
- ★Palmer & Singer Mfg. Co., 1618-20 Broadway, N. Y. City. (Simplex Automobile Co.)
- Pettingell-Andrews Co., 156-160 Pearl St., Boston, Mass. (Jacobson-Brandow Co., & Philadelphia Timer & Machine Co.)
- Pike Mfg. Co., Pike, N. H. (Norton Co., India Oil Stones.)
- Pioneer Auto Top & Supply Co., 1721 Baltimore Ave., Kansas City, Mo. ("McGregor" bumpers, "Emancipator" & "Baby" air bottles & "Friction" & "Zig-zag" wind shields.)
- Pittsburg Agency Co., P. O. Box 154, East Liberty Station, Pittsburg, Pa. (Parting compound, leather fillet, chaplets, core compound, core oil & Tripoli.)
- Railway Specialty & Supply Co., The, Monadnock Bldg., Chicago, Ill. (Fort Pitt Spring & Mfg. Co.)
- Reynolds, Harry H., 1205 Monadnock Block, Chicago, Ill. (Eberman Auto Appliance Co., Inner Shoe Tire Co., Northwestern Chemical Co., & Randall-Faichney Co.)
- Scherer, H. & Co., Detroit, Mich. (Leather, cloth, rubber, artificial leather, celluloid & other top materials.)
- Seidler-Miner Supply Co., 207-211 Jefferson Ave., Detroit, Mich. (Willard Storage Battery Co., & Holtzer-Cabot Electric Co.)
- Simplifity Mfg. Co., 5607 St. Clair Ave., Cleveland, O. (Reflex Ignition Co.)
- Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill. (Prest-O-Lite Co. & The Safety Device Co.)
- Smith, J. Stewart, 1779 Broadway, N. Y. City. (Whittaker Chain Tread Co., LeCompte Mfg. Co., "Double Lock" Tire Patches & "Lindholm" Grease Cups.)
- Smith Motor Car Co., The, Topeka, Kans. (Smith Auto Co.)
- Standard Gas Engineering Co., Rooms 33-34, Davis Block, Bradford, Pa. (Bradford Motor Works.)
- Standard Tire & Rubber Co., 102 Portland St., Boston, Mass. (Federal Rubber Co., Thermoid Rubber Co., Tray Plate Battery Co.)
- Steinberg, Norman L. & Co., 904 Ashland Block, Chicago, Ill. (McGraw Tire & Rubber Co.)
- Sterling Auto Top Co., Congress & First Sts., Detroit, Mich. (Prest-O-Lite Co., Motor Appliances Co.)
- Stevens & Co., 375 Broadway, N. Y. City. (Sartus Ball Bearing Co., American Lava Co., A. N. Clark & Co., Ellis Mfg. Co. & Clark Bros. Eolt Co.)
- T. C. M. Mfg. Co., The, 46 Lawrence St., Newark, N. J. (Case hardening steel, nickel steel, chrome nickel steel & chrome vanadium steel.)
- Thompson, John H. & Co., 327 Jefferson Ave., Detroit, Mich. (Ajax Battery Co., Chas. D. Shain, Gustave Cornelis & Co., Lavalette & Co., Jacobsen & Brandow Co., Rose Mfg. Co., Bertram & Lamereaux, "Du Brelle" Lubricators, London, Eng.)
- Thurston, F. W., Chicago, Ill. (Wood & de-natured alcohol.)
- Tiger Cycle Works Co., 782 8th Ave., N. Y. City. ("Royal Pioneer" & "Reliance" motorcycles, "Raecycle" bicycles, sundries & accessories.)
- Trans-Atlantic Mercantile Co., 172 Fifth Ave., N. Y. City. "Mazo." (Powdered toilet soap.)
- ★United Manufacturers, The, Broadway & 76th St., N. Y. City. (Jones Speedometer, Inc., Weed Chain Tire Grip Co., C. A. Mezger, Inc., Connecticut Telephone & Elec. Co. & N. Y. & N. J. Lubricant Co.)
- Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo., (Troy Carriage Sunshade Co.)
- Waddell, R. J. & Co., 52 Beekman St., N. Y. City. (Schumachersche, Bimstine & Eureka rubbing brick, German steel wool, rubbing felts, etc.)
- Weiland, Chas., 147-49 Chambers St., N. Y. City. (John Day files and rasps, C. E. Jennings pliers & nippers, H. J. Brown hammers, tool kits, etc.)
- Western Sales Co., 601-03 Stevens Bldg., Detroit, Mich. (Ansted Spring & Axle Co., Indiana Lamp Co., Hobbs Mfg. Co., Standard Fibre Co., Michigan Auto Body Co., Wilcox-Bennett Carburetor Co. & Peninsular Milled Screw Co.)
- Wetzel, Thos. J., 29 W. 42nd St., N. Y. City. (Brown-Lipe Gear Co., The Whitney Mfg. Co., Continental Motor Mfg. Co., Pittsfield Spark Coil Co., Syracuse Aluminum & Bronze Co., & Spicer Universal Joint Mfg. Co.)

★ indicates Advertisers—see Index in back of book.



**MANUFACTURERS' SALES AGENTS—Continued**

- White & Von Wettberg, 424 Asylum St., Hartford, Conn. (The Jeffery-Dewitt Co., F. E. Bowers Co., Safety Insulated Wire & Cable Co.)
- ★Willys-Overland Co., Toledo, O. (Marion Automobile & Mfg. Co.)
- Young, Frank L. & Kimball, 111 Purchase St., Boston, Mass. (Warren Lubricator Co.)
- Zenith Motor Goods Co., 1841 Euclid Ave., Cleveland, O. (Beebe-Eliot Co., Abrams-Mason Co.)

**MAPS**

(See Publications.)

**MARINE ARTICLES, Miscellaneous**

- Curtiss Co., 20 Fulton St., New York City. (Plumbing supplies.)
- Goblet-Dolan Co., 30 Old Slip, N. Y. City. "C-Yacht." (Ventilators, deck plates.)
- Laughlin, The Thos. Co., 143 Fore St., Portland, Me. (Blocks & windlasses.)
- Michigan Steam Motor Co., Pike & Garland Sts., Pontiac, Mich. (Automatic air pumps for whistles.)
- Morss, A. S. Co., 210-212 Commercial St., Boston, Mass. "Skene." (Chocks.)
- Nicholson Ship Log Co., Cleveland, O. (Distance finders; direction indicators.)
- Seidler-Miner Supply Co., 207-211 Jefferson Ave., Detroit, Mich. (Electric fixtures.)
- Turner Brass Works, The, Sycamore, Ill. (Chocks.)
- Waterman Marine Motor Co., 1506-1512 Fort St., West, Detroit, Mich. (Pumping outfits.)

**MARINE MOTORS, Alcohol**

Wolverine Motor Works, Bridgeport, Conn.

**MARINE MOTORS, Gasoline**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill. "Humming Bird."
- American & British Mfg. Co., Bridgeport, Conn. "A & B."
- Anderson Engine Co., Shelbyville, Ill. "Anderson."
- ★Anderson Motor Co., The, 16th & Jackson Sts., Anderson, Ind. "Westerfield."
- Antoinette Motor Co., E., Providence, R. I.
- Atlantic Co., The, Amesbury, Mass. "Atlantic" & "Atlantic Special."
- ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor."
- Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich.

- Auto Engine Works, Rice & Fuller Sts., St. Paul, Minn. "Capitol."
- Automatic Machine Co., The, Bridgeport, Conn. "Automatic."
- Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich. "Yale."
- Barber Bros., 101 Grape St., Syracuse, N. Y.
- Barker, C. L., Norwalk, Conn.
- Bath Marine Construction Co., Bath, Me.
- Beaver Mfg. Co., 783 Chase St., Milwaukee, Wis. "Beaver."
- Beers Bros. Engine Co., Portland, Ave. & Norton St., Rochester, N. Y. "Beers."
- ★Beilfuss Motor Co., The, Cor. Saginaw St. & M. C. R. R., Lansing, Mich. "Beilfuss."
- Benton, Thos. P. & Son, La Crosse, Wis. "Benton."
- Bintliff, W. T., Plainfield, N. J. "Alpha." (2 cycle.)
- ★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. "Brennan."
- Brill Engine Works, Appleton, Wis. "Brill."
- ★Brownell, F. A. Motor Co., 634-636 Lexington Ave., Rochester, N. Y.
- Brown, The B. F. Gas Engine Co., 402 S. Franklin St., Syracuse, N. Y. "Brown" & "Brownie."
- Brown-Talbot Co., 19 Oakland St., Salem, Mass.
- Buffalo Auto-Truck & Motor Co., Sussex St., Buffalo, N. Y.
- Buffalo Gasoline Motor Co., 1280-90 Niagara St., Buffalo, N. Y. "Buffalo."
- Burdick Motor Car Co., Eau Claire, Wis. "Burdick."
- ★Cady, C. N. Co., Inc., Canastota, N. Y. "Cady."
- Caille Perfection Motor Co., 1300-30 Second Ave., Detroit, Mich. "Perfection."
- Camden Anchor-Rockland Machine Co., Camden, Maine. "Knox."
- Cayuga Motor Boat Co., Cayuga, N. Y.
- Champaign Bros., Ithaca, N. Y.
- Clay, E. H. & Co., 6350 Kinsman Road, Cleveland, Ohio.
- Clifton Motor Works, 229 E. Clifton Ave., Cincinnati, O. "Clifton."
- Clipper Lawn Mower Co., Dixon, Ill. "Clipper."
- Columbus Screw & Machine Co., The, 244 Kaiser St., Columbus, O. "Columbus."
- Comet Motor Works, 438 W. Madison St., Chicago, Ill. "Comet."
- Consolidated Carpet Sewing Machine Co., The, Bridgeport, Conn.
- Continental Motor Mfg. Co., Muskegon, Mich. "Continental."
- Cooley Mfg. Co., Waterbury, Vt.
- Craig, James, 556 W. 34th St., New York, N. Y.
- Cushman Motor Works, 2020-2030 N St., Lincoln, Neb. "Cushman."
- ★Davis Mfg. Co., 15th St., & Park Ave., Milwaukee, Wis. "Davis."
- Dean Mfg. Co., South Cincinnati, Newport, Ky. "Fox."
- DeDion Bouton Selling Branch, 1649 Broadway, N. Y. City. (Imported.)
- Delaware Machine Works, Wilmington, Del. "Harris."
- De Mooy Bros., E. 55th St., Cleveland, O.
- Derain Motor Co., The, 7500 Quincy Ave., Cleveland, O. "Derain."
- Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich. "Liberty."
- Doman, The H. C. Co., Oshkosh, Wis.
- Du Brie Motor Co., 436-442 Guoin St., Detroit, Mich.
- ★Duryea, Chas. E., Reading, Pa. "Duryea."
- Eagle Co., The, 98 Warren St., Newark, N. J. "Eagle."
- Eastern Power Truck Co., Providence, R. I.
- Economic Engine Works, 3 Fulton St., Utica, N. Y.
- Elbridge Engine Co., Culver Road, Rochester, N. Y. "Elbridge" & "Featherweight."
- Emerson Engine Co., Alexandria, Va.

**MARINE MOTORS, Gasoline—Continued**

- Emery, V. J., Wollaston, Mass. "Ideal."  
 Enterprise Machine Co., 1114-22 S. Third St., Minneapolis, Minn. "Westman."  
 ★Essex Engine Co., The, 416 Union St., Lynn, Mass. "Essex."  
 Everts Machine Co., 18 Hicks St., Hartford, Conn.  
 Excelsior Motor & Mfg. Co., 2200-30 Union Ave., Chicago, Ill. "Excelsior."  
 Fairbanks, Morse & Co., Chicago, Ill. "Fairbanks Morse."  
 Fay & Bowen Engine Co., 76 Lake St., Geneva, N. Y.  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O. "Ferro."  
 Fifield Bros. Co., 337 Water St., Augusta, Me. "Capital."  
 Fischback Mfg. Co., 3714 N. Madison Ave., Peoria, Ill. "Fischback."  
 Frisbie-Heft Motor Co., The, Middletown, Conn. "Frisbie."  
 Fulton Engine Co., Erie, Pa. "Fulton."  
 Gaffga, J. S. & Co., Greenport, N. Y. "Greenport."  
 Gas Engine Power Co. & Chas. L. Seabury & Co., Morris Heights, N. Y. (And naphtha.)  
 General Machinery Co., Bay City, Mich. "Smalley."  
 Goshen Motor Works, Goshen, Ind. "Goshen."  
 Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich. "Monarch."  
 Granse-McCormick Machine Co., 223 North Niagara St., Saginaw, W. S., Mich.  
 Grasser Motor Co., 104 Ottawa St., Toledo, O. "Grasser."  
 ★Gray-Hawley Mfg. Co., 605-609 Fort St., West, Detroit, Mich. "Skipper."  
 Gray Motor Co., Leib & Larned Sts., Detroit, Mich. "Gray."  
 Gray & Prior Machine Co., 90 Suffield St., Hartford, Conn. "Hartford."  
 Greenhalgh Engine & Machine Works, 550 & 552 Central Ave., Newark, N. J. "Clinton."  
 Gunderson-Walter Co., The, 182-94 Bellevue Ave., Detroit, Mich.  
 Haase Motor Works, 1017 Lloyd St., Milwaukee, Wis. "Haase."  
 Hall Gas Engine Mfg. Co., Byesville, Ohio. "Hall."  
 Harms Bros., 900-902 S. Ann St., Baltimore, Md. "Eclipse." (2 & 4 cycle.)  
 Harriman Motor Works, The, South Glastonbury, Conn. "HF."  
 Hawley, R. B. Motor Works, Calhoun St., Jackson, Mich.  
 ★Hazard Engineering Co., Maple & Scherer Sts. & N. Y. C. R. R., Rochester, N. Y.  
 Heinel, H. A. Co., Monroe & Fifth Sts., Wilmington, Del.  
 Herbert Mfg. Co., Inc., Nazareth, Pa. "Herbert."  
 Herschell-Spillman Co., North Tonawanda, N. Y.  
 Hettinger Engine Co., Bridgeton, N. J. "Hettinger."  
 Holliday Engineering Co., 749 Bunker St., Chicago, Ill. "Holliday."  
 Holm Machine Mfg. Co., Sparta, Mich. "Mortorgo."  
 Hunter-Weckler Boat Co., The, McHenry, Ill.  
 Ideal Mfg. Co., Portsmouth, Ohio. "Ideal."  
 Imperial Gas Engine Co., 60 Clementina St., San Francisco, Cal. "Imperial."  
 Jager, Chas. J. Co., 281-285 Franklin St., Boston, Mass. "Jager."  
 Jencick Motor Mfg. Co., Port Chester, N. Y.  
 Johnson & Wells Machine Co., Neenah, Wis. "Johnson."  
 Jones, The S. M. Co., 600 Segur Ave., Toledo, O. "Ralaco."  
 Jones & Schumacher, 1100 West St., Wilmington, Del. "Heinel."  
 Kahlenberg Bros., Two Rivers, Wis.  
 Keidel, Henry & Co., 405 W. German St., Baltimore, Md. "Ardmore."  
 Kershaw-Williams Co., 29-33 Haverhill St., Boston, Mass. "K-W Special."  
 Kidder, E. E., Dover, N. H.  
 Knock-Down Motor Co. of America, 150 Broadway, N. Y. City. "K. & M. System." (Knock down.)  
 Kowalsky, John, Motor Works, Verona, Pa.  
 Lackawanna Mfg. Co., Newburgh N. Y. "Lackawanna."  
 ★Lamb Boat & Engine Co., Clinton, Ia.  
 Lamont & Steers Engine Co., Stegmeyer's Boat Harbor, Rear 1470 Jefferson Ave., E., Detroit, Mich.  
 Landis, E. M. Gas Engine Works, 6 St. Clair St., Toledo, O.  
 Lauth Auto & Engine Co., 769 Water St., Port Huron, Mich. "Wat."  
 Lindley, W. H. Co., Main & Canal Sts., Canastota, N. Y. "Lindley."  
 Lippert, H., 2810 N. 11th St., St. Louis, Mo. "Missouri."  
 Lisk, Geo. A., 1193-95 Jefferson Ave., W., Detroit, Mich. "Lisk."  
 Loane-Hiltz Engineering Co., 306 S. Hanover St., Baltimore, Md. "Fisherman," "Dredger" & "Thermo."  
 Lockwood Ash Motor Co., Jackson, Mich.  
 Manlius Motor Co., Manlius, N. Y.  
 Marine Motor Mfg. Co., 5 Park Sq., Boston, Mass. "Boston."  
 Mark Motor Co., 8721 Harkness Rd., Cleveland, O. "Mark."  
 Mason, Wm. H., Mt. Carmel, Ill. "Mason."  
 Maxwell & Fitch Co., Rome, N. Y.  
 Mianus Motor Works, Mianus, Conn.  
 Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich. "Detroit."  
 Miller Bros., 2331 N. Talman Ave., Chicago, Ill.  
 Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis. "Majestic."  
 Milwaukee Motor Co., 32nd & Burleigh Sts., Milwaukee, Wis.  
 Mingst, C. P., 1230 Riverside Ave., Evansville, Ind. "Evansville."  
 ★Model Gas Engine Works, Peru, Ind.  
 ★Monarch Motor Mfg. Co., 3145 N. Halsted St., Chicago, Ill. "Monarch."  
 Morton Marine Motor Co., 927 Chestnut St., Camden, N. J.  
 Motor Marine Engine & Boat Repair Co., 126 Liberty St., N. Y. City.  
 Mullins, W. H. Co., Salem, O.  
 Murray Machine Works, Winchester & Wabansia Aves., Chicago, Ill.  
 Murray & Tregurtha Co., South Boston, Mass.  
 National Steel Products Co., The, Lorain, O. "Lorain."  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 New England Marine Engine Co., Norwalk, Conn.  
 New London Motor Co., New London, Conn. "Pequot."  
 New York Yacht, Launch & Engine Co., The, Morris Heights, N. Y. City. "20th Century."  
 Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. (To order.)  
 Noank Motor Co., The, Noank, Conn.  
 Norfolk Motor Co., Wollaston, Mass. "Norfolk."  
 North Chicago Machine Co., The, North Chicago, Ill.  
 Norwood Machine Co., Norwood, O.  
 Ontario Iron Works, Pulaski, N. Y. "Ontario."  
 Oswald Motor Co., Goshen, Ind.  
 Page Engineering Co., 113-121 E. York St., Baltimore, Md. "Orloie" & "Baltimore."  
 Palmer Bros., Coscob, Conn.  
 Panhard & Levassor, Broadway & 62nd St., N. Y. City. (Imported.)

# MARINE MOTORS, Gasoline—Continued

Pease, The Fred. J. Co., 36 Court St., Grand Rapids, Mich. "Pease."  
 Peerless Motor Co., Lansing, Mich.  
 Pekin Engine & Machine Works, Second & Sabella Sts., Pekin, Ill.  
 Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill. "Phillips."  
 Pierce Motor Co., The, Racine, Wis.  
 Piggins Bros., Racine, Wis.  
 Portage Boat & Engine Co., 105 Mullet St., Portage, Wis. "Portage."  
 Progressive Mfg. Co., The, Torrington, Conn. "Eagle."  
 Pungs-Finch Auto & Gas Engine Co., 1524 Jefferson Ave., Detroit, Mich.  
 Puritan Engine Co., 29-33 Haverhill St., Boston, Mass.  
 Racine Boat Mfg. Co., Muskegon, Mich. "Racine."  
 Red Wing Boat Mfg. Co., Red Wing, Minn. "Red Wing."  
 Regal Gasoline Engine Co., Coldwater, Mich.  
 Reynolds Motor Co., 35 Equity Bldg., Detroit, Mich. (Rotary disc valve.)  
 Rice, John V. Jr., & Co., Bordentown, N. J.  
 Roberts Motor Co., Sandusky, Ohio. "Roberts."  
 Rochester Gas Engine Co., 707 Driving Park Ave., Rochester, N. Y. "Rochester."  
 Ross & Browne, 6127 Cottage Grove Ave., Chicago, Ill.  
 Royal Engine Co., Bridgeport, Conn. "Royal."  
 Ryan, W. M. Co., 314 S. Canal St., Chicago, Ill. "Shortt."  
 Sayre Stamping Co., Sayre, Pa.  
 Schaefer Mfg. Co., Berlin, Wis. "Schaefer."  
 ★Schlosser Mfg. Co., 151 East 126th St., N. Y. City.  
 Seitz, F. A. Co., 143 Frelinghuysen Ave., Newark, N. J.  
 Sheffield Car Co., Three Rivers, Mich.  
 Sherman & Smith Mfg. Co., Independence, Ia.  
 Sibley-Houffey Machine Co., The, 180 Brush St., Detroit, Mich. "Peerless."  
 Sintz, Guy L. Co., Marshall, Mich. "Sintz."  
 Sintz-Wallen Co., Grand Rapids, Mich.  
 Sparks, C. F. Machine Co., Alton, Ill.  
 Spaulding Engine Co., The, St. Joseph, Mich. "Spaulding."  
 Springfield Motor Co., The, Springfield, Mass. "Springfield."  
 Stamford Motor Co., Inc., Foundry, Water & Atlantic sts., Stamford, Conn. "Stamford" & "Sneekner."  
 Standard Gas Engine Co., Dennison & King Sts., Oakland, Cal. "Standard."  
 Sterling Engine Co., 1250-1260 Niagara St., Buffalo, N. Y.  
 Sterling Engine Co., 108-110 N. Clinton St., Chicago, Ill.  
 Strelinger Marine Engine Co., 171-175 Woodbridge St., W., Detroit, Mich. "Little Giant."  
 Stuart, John Co., Wollaston, Mass. "Stuart."  
 Syracuse Gas Engine Co., Syracuse, N. Y. "Syracuse."  
 Tallmadge, J., Baldwinville, N. Y. "American." (Also knock-down engines.)  
 Teel Mfg. Co., Medford, Mass. "Teel."  
 Terry Engine Co., Bay, 43rd & 44th Sts., Ulmer Park, Brooklyn, N. Y.  
 Tessmer Machine & Tool Co., 285-287 Rivard St., Detroit, Mich. "Crown."  
 1000 Island Boat & Engine Co., Morristown, N. Y. "Lloyd."  
 Thrall Motor Co., 35 Fort St., East, Detroit, Mich. "Refined."  
 Toppan Boat Mfg. Co., 25 Haverhill St., Boston, Mass. "Toppan."  
 Toquet Mfg. Co., 1 Madison Ave., N. Y. City. "Toquet."  
 Torrey Roller Bushing Works, Bath, Me. "Kennebec."  
 Trebert, H. L. F., 407 St. Paul St., Rochester, N. Y. "H. L. F. Trebert."

Trebert Gas Engine Co., Butler, Ind.  
 Truscott Boat Mfg. Co., St. Joseph, Mich.  
 Tuttle, D. M. & Co., Canastota, N. Y. "Tuttle."  
 Ulrich, J. M., Greenwich, Conn. "Ulrich."  
 United States Engine Works, The, 715 South Main St., Oshkosh, Wis.  
 Valley Boat & Engine Co., Baldwinville, N. Y. "Faultless."  
 Vim Motor Mfg. Co., The, Market & Hancock Sts., Sandusky, O. "Vim."  
 Walnut Machine & Brass Foundry Co., 316 Walnut St., Toledo, O. "Walnut." (Portable outboard.)  
 Warren Mfg. Co., Warren, Mass.  
 Waterman Marine Motor Co., 1506-1512 Fort St., West, Detroit, Mich. (Also outboard or porto motors.)  
 Watertown Motor Co., 112 Moulton St., Watertown, N. Y. "Watertown."  
 Watkins Motor Co., The, 525-31 Baymiller St., Cincinnati, Ohio.  
 Watt Motor Co., 564 Porter St., Detroit, Mich. "Watt."  
 ★Waukesha Motor Co., Waukesha, Wis. "Waukesha."  
 Western Launch & Engine Works, Michigan City, Ind.  
 ★Western Motor Co., Logansport, Ind. "Ruttenber."  
 Whitehall Motor & Boat Co., Whitehall, N. Y. "Whitehall."  
 ★Willett Engine & Carburetor Co., The, 764 Ellicott Sq., Buffalo, N. Y. "Willett."  
 Wisconsin Machinery & Mfg. Co., Canal St. & Muskego Ave., Milwaukee, Wis.  
 Wisconsin Motor Mfg. Co., Dept. 27, North Milwaukee, Wis. "Wisconsin."  
 Wolverine Motor Works, Bridgeport, Conn. "Wolverine."  
 Wright, C. T. Engine Co., 1005 Speed St., Greenville, Mich. "Weco." (2-cycle.)  
 Wright Motor Co., 48 S. Division St., Buffalo, N. Y.  
 Yacht Gas Engine Launch Co., Phila., Pa. "Crown."  
 ★Yocum, A. H. Co., Inc., Reading, Pa. "The Speedwell." (2-cycle.)

# MARINE ENGINES, Kerosene

American Oil Engine Co., 1779 Broadway, N. Y. City. "American."  
 ★Du Brie Motor Co., 436-442 Guoin St., Detroit, Mich.  
 Fay & Bowen Engine Co., 76 Lake St., Geneva, N. Y.  
 Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.  
 Imperial Gas Engine Co., 60 Clementina St., San Francisco, Cal. "Imperial."  
 Jager, Chas. J. Co., 281-285 Franklin St., Boston, Mass. "Jager."  
 Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich. "Detroit."  
 Mietz, Aug., 128-138 Mott St., N. Y. City. "Mietz."  
 Nichols Power Co., Stamford, Conn. "Nichols."  
 Putnam Motor Mfg. Co., 57 Lebanon St., Springfield, Mass. "Putnam."  
 Remington Oil Engine Co., 700 Pacific St., Stamford, Conn. "Remington."  
 Strang Engine Co., Harvey, Ill. "Strang."  
 Wolverine Motor Works, Bridgeport, Conn. "Wolverine."

**MARINE ENGINES, Steam**

Detroit Steam Engine Co., 15 Gilman St., Detroit, Mich. "McLachlan."  
 Dieter Steam Engine Co., 123 Liberty St., N. Y. City. "Dieter."  
 Gas Engine Power Co., & Chas. L. Seabury & Co., Morris Heights, N. Y.  
 Ofeldt, August & Sons, 123 Liberty St., N. Y. City.  
 Ofeldt, F. W. & Son, Nyack, N. Y.  
 Racine Boat Mfg. Co., Muskegon, Mich. "Racine."  
 Racine Engine & Machinery Co., Racine, Wis. "Racine."  
 Wright, L. Machine Works, 9-15 Alling St., Newark, N. J.

**MARINE ENGINE FITTINGS**

Haydenville Co., The, Haydenville, Mass.  
 Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna." (Exhaust & water.)  
 Mechanical Devices Co., Inc., Watervliet, N. Y. "Indispensable."  
 Moto Marine Engine & Boat Repair Co., 126 Liberty St., N. Y. City.  
 Terry Engine Co., Bay, 43rd & 44th Sts., Ulmer Park, Brooklyn, N. Y.

**MARINE LIGHTING OUTFITS**

(See Boat Lighting Outfits.)

**MASTER VIBRATORS**

★K-W Ignition Co., The, 40 Power Ave., Cleveland, O. "K-W."

**MATS, Carpet & Linoleum**

Acme Steel Goods Co., 2834 Archer Ave., Chicago, Ill. "Acme." (Steel mats.)  
 ★Ajax-Grieb Rubber Co., 1777 Broadway, N. Y. City. (Rubber mats & matting.)  
 Barnard, Wm. H. Rubber Co., 257 S. 4th St., Phila., Pa. (Rubber mats & matting.)  
 Blahon, Geo. W. Co., 34 N. Fifth St., Phila., Pa. (Linoleum.)  
 Boston Belting Co., 256-60 Devonshire St., Boston, Mass. "Excelsior" & "Universal." (Rubber matting.)  
 Cary Mfg. Co., 19 & 21 Roosevelt St., N. Y. City. "Cary's." (Steel mats for running boards or steps.)  
 Cincinnati Rubber Mfg. Co., The, Cincinnati, Ohio. (Rubber matting.)  
 Cochrane Mfg. Co., East Deadham, Mass. (Carpets.)  
 Combination Rubber Mfg. Co., Bloomfield, N. J. (Rubber mats & matting.)  
 Darragh & Small, 177 Water St., N. Y. City. (Cocoa mats.)

★Diamond Rubber Co., Akron, O. "Diamond." (Rubber mats & matting.)  
 Dusenbury, Louis & Co., Inc., 79-81 Worth St., N. Y. City. (Carpets.)  
 East India Mfg. Co., Baltimore, Md. (Cocoa mats.)  
 Farr & Bailey Mfg. Co., Camden, N. J. (Linoleum & cork carpet.)  
 Hamilton Rubber Mfg. Co., Trenton, N. J. "White Pyramid." (Matting.)  
 Heywood Bros. & Wakefield Co., Boston, Mass. (Mats.)  
 Holliday, W. J. & Co., Indianapolis, Ind. (Rubber mats & matting.)  
 Kempf, Geo. F. & Bro., 1021-1033 N. 4th St., Phila., Pa. (Cocoa matting.)  
 Mansfield Rubber Co., Mansfield, O. "Mansfield." (Rubber mats.)  
 Massachusetts Chemical Co., Walpole, Mass. (Rubber mats.)  
 Mattson Rubber Co., Lodi, N. J. (Punched rubber mats and rubber matting.)  
 Mechanical Rubber Co., C. & P. R. R., near Nickel Plate R. R., Cleveland, Ohio. "Cleveland." (Mats & matting.)  
 Metallic Automobile Matting Co., Box 555, Rochester, N. Y. "Pyramid." (Aluminum matting.)  
 Monarch Rubber & Oil Cloth Co., 41 N. 7th St., Phila., Pa. (Rubber mats & matting.)  
 Nairn Linoleum Co., The, Kearny, N. J. (Linoleum & cork carpet.)  
 New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J. (Rubber mats & matting.)  
 New York Belting & Packing Co., 91 Chambers St., N. Y. City. (Matting.)  
 Pennsylvania Rubber Co., Jeannette, Pa. (Rubber matting.)  
 Rancocas Mills, Trenton, N. J. (Cocoa mats.)  
 Roehm & Davison, Ltd., Detroit, Mich. (Wilton carpet.)  
 Sloane, W. & J., 19th St., & Broadway, N. Y. City. (Cocoa mats & matting, cork carpet, linoleum, etc.)  
 ★Thermoid Rubber Co., Trenton, N. J. (Matting.)  
 Trenton Oil Cloth & Linoleum Co., Trenton, N. J. "Cook's." (Linoleum & cork carpet.)  
 United Globe Rubber Mfg. Co., Trenton, N. J. (Mats & matting.)  
 Victor Rubber Co., The, Springfield, O. (Rubber mats.)  
 Walpole Rubber Works, Walpole, Mass. "Walpole." (Rubber matting.)  
 Westboro Mills, Westboro, Mass. (Carpet.)  
 Wild, Joseph & Co., 366-370 Fifth Ave., N. Y. City. (Linoleum & cocoa mats.)  
 Worth Wire Co., 1509 N. Washington St., Kokomo, Ind. (Flexible wire mats.)

**MEGAPHONES**

Horstmann, Wm. H. Co., 5th & Cherry Sts., Phila., Pa.  
 Lockwood Co., The, 34 Mechanic St., Newark, N. J.  
 Pape, H. G. Electric & Mfg. Co., 551 Genesee St., Buffalo, N. Y. "Auristophone." (Telephone.)  
 Parry, A. N. & Co., Amesbury, Mass.  
 Perpete Mfg. Co., State & Wall Sts., New Haven, Conn.  
 Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J.  
 Sanders, Chas., 182 DeKalb St., Brooklyn, N. Y.  
 Strong, M. H., 168 South Ave., Rochester, N. Y.

## METAL

(See Raw Material.)

## METAL CEMENTS

(See Cements, Metal.)

## METAL FIGURES & LETTERS

- Art Sign Co., Room C, De Graaf Bldg., Albany, N. Y. (Lamp.)  
 Balzer, Gus, 1777-79 Broadway, N. Y. City. "Balzer's." (Interchangeable lamp numbers.)  
 Bliss, E. C. Mfg. Co., 91 Sabin St., Providence, R. I.  
 Chanavas & Son, 920 Eighth Ave., N. Y. City. "Franco-American."  
 Cleveland-Galvanizing Works Co., 18-24 Cooper St., Cleveland, Ohio. "Die-Cast."  
 Colgan, J. W. Co., 509 Sudbury Bldg., Boston, Mass.  
 Fine, Horace E. Co., 19 E. State St., Trenton, N. J. (Aluminum figures & lamp numbers.)  
 Hickok Mfg. Co., The, Rochester, N. Y. (Initials.)  
 Mulhaupt, F. Jos., 227 N. 5th St., La Fayette, Ind. (Lamp numbers.)  
 Murdock, The James, Jr., Co., 112 Opera Place, Cincinnati, O. (Aluminum & brass.)  
 Ness, Geo. M., Jr., N. Y. City.  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.  
 Robbins, John Mfg. Co., 58 Kneeland St., Boston, Mass.  
 Ronson Specialty Co., 7 Mulberry St., Newark, N. J. "Ronson." (Auto initials.)  
 Stafford, N. Co., 67 Fulton St., N. Y. City.  
 Stillman, A. P., 124 Chambers St., N. Y. City.  
 Troxel Mfg. Co., Elyria, O. (Brass letters and ornaments.)  
 Whiteford, Jos. G. & Co., 165 N. Jefferson St., Chicago, Ill.

## METAL POLISH

(See also Wood Polish.)

- Acme Polish Co., 810 Second Ave., Pittsburg, Pa. "Ayrolite," "Rising Sun," "Acme" & "Silver Dust."  
 Adams & Elting Co., 159-63 Washington Blvd., Chicago, Ill. "Auto-Bright."  
 Ajax Auto Co., 832-34 E. 43rd St., Chicago, Ill. "Ajax."  
 Allen, L. B. Co., Inc., 1353 Columbia Ave., Chicago, Ill. "Al-electro."  
 Allers, Harry A. & Co., 136 Liberty St., N. Y. City. "Solarine."  
 American Metal Polish Co., 89 Winslow Ave., West Somerville, Mass. "Meyer's Putz Cream," "North Star" & "Universal Metal Putz Pomade."  
 American Oil & Disinfectant Co., 96 Beekman St., N. Y. City. "Sparrow."  
 Armiger Chemical Co., 2155-57 Austin Ave., Chicago, Ill. "Rex."

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of a beautiful COMBINATION CELLULOID PEN AND PENCIL with sample of LORD'S LUMINO BRASS POLISH will be sent ONLY to DEALERS, GARAGES AND REPAIRMEN if they use their own printed stationery.

Send now, and do not be disappointed.



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**METAL POLISH—Continued**

- Atlantic Refining Co., Citizen's Bldg., Cleveland, O. "Spotzoff."
- Automobile Repair Co., 1103-05 Pine St., St. Louis, Mo.
- Auto Oil Co., 172 S. Water St., Jackson, Mich. "Red Cross."
- Bacon & Hancock, 715 Congress Ave., Austin, Texas. "B. & H."
- Bailey Oil Co., Toledo, O. "Bill Bailey."
- ★Baum's Castorine Co., Rome, N. Y. "Baum's."
- Bell Mfg. Co., 308 N. Commercial St., St. Louis, Mo. "Star."
- Bobrick Chemical Co., The, 111-117 S. Garey St., Los Angeles, Cal. "Radium."
- Borsum Bros., Greenwich & Fulton Sts., N. Y. City.
- Boston Grease Co., Boston, Mass. "Searchlight."
- ★Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y. "Shinebright."
- Caldwell, E. P. Co., 219 E. Fourth St., Waterloo, Ia. "Caldwell's Electroline."
- Cancos Mfg. Co., 146 N. 2nd St., Phila., Pa. "Cancos."
- Cleaner Mfg. Co., 2842 Olive St., St. Louis, Mo. "Polishine," "The King Powder" & "The Engineer Pomade."
- Cleanola Company, The, 1101 Fulton Bldg., Pittsburg, Pa. "Spe-De-Shyne."
- Colgan Mfg. & Supply Co., 42 South St., N. Y. City. "Colgan's Peerless" & "Colgan's Crescent."
- Cross, W. H. & Ladd Co., 29 Murray St., N. Y. City. "Gilt Edge," "Lacquerine," "Prestoline," "Putzade" & "Putz."
- ★Crown Mfg. Co., The, 407 S. Illinois St., Indianapolis, Ind. "Bailey's Crown."
- Crown Soap Co., 1941-43 West Fayette St., Syracuse, N. Y. "Crown."
- Curry Oil & Supply Co., Boston, Mass. "Superba."
- ★Davey & Co., 2600-08 Grand Ave., Chicago, Ill. "Puritan."
- Detroit Varnish Co., Detroit, Mich. "Rogers Auto Brassshine."
- Edmonds, J. Wesley & Son, 214 Franklin St., N. Y. City. "Electric."
- Ericka Mfg. Co., The, Inc., 872-882 Liberty St., Springfield, Mass. "Shineaul."
- Essex Paint Works, Essex, Conn. "Best of All."
- Fairchild, M. H. & Bro., 20 W. Michigan St., Chicago, Ill.
- Flash Chemical Co., 9 & 10 Fulton St., Boston, Mass. "Flash."
- Foskett & Co., 226-28 La Salle St., Chicago, Ill. "Diamond."
- Franklin Oil Works, Franklin, Pa.
- German Chemical Supply Co., The, 1565 Merwin Ave., Cleveland, O. "Perfection."
- Grady Mfg. Co., 509 W. 30th St., N. Y. City. "Grady's Scourer," "Glittershine" & "Summershine."
- Great Western Oil Co., 2855 E. 37th St., Cleveland, O. "G. W."
- Hanson & Van Winkle Co., Newark, N. J. "H & V W."
- Harris, A. W. Oil Co., 326-8 S. Water St., Providence, R. I. "Harris."
- Harvey Chemical Co., The, Lafayette, Ind. "American." (Liquid & paste.)
- Heaney Mfg. Co., 164 State St., Boston, Mass. "Heaney's."
- Hercules Chemical Works, 1904 W. Van Buren St., Chicago, Ill. "Non-Such."
- Hinds & Coon, 124-26 Pearl St., Boston, Mass. "Ruby-Rub."
- Hoffman, Geo. Wm., 549 E. Washington St., Indianapolis, Ind. "U. S."
- Hoffman, J. W. Co., 8 Medford St., Boston, Mass. "Anchor."
- ★Hollingshead, The, R. M. Co., Camden, N. J. "Whiz."
- ★Hopewell Bros., 29 Chapel St., Newton, Mass. (Brass.)
- Idealo Co., 228 N. 4th St., Phila., Pa. "Idealo."
- Imperial Polish Co., The, 208 W. Kinzie St., Chicago, Ill. "Monkeyshine."
- ★International Metal Polish Co., 2142 N. Capitol Ave., Indianapolis, Ind. "Blue Ribbon." (Cream.)
- Jewel Mfg. Co., 21st St. & Marshall Blvd., Chicago, Ill. "Nelson."
- Kielgass-Lehman Co., 208 W. Kinzie St., Chicago, Ill. "Monkeyshine."
- Kortum Mfg. Co., 10-12 Pearl St., Buffalo, N. Y. "Zircon."
- Lightning Flash Specialty Co., 236 E. 5th St., Cincinnati, Ohio. "Lightning Flash."
- ★Lord, F. T. Polish Co., 37 Hovey Ave., Cambridge, Mass. "Lumino."
- McKenna Bros. Brass Co., First Ave. & Ross St., Pittsburg, Pa. "Keystone" & "Mexoline." (Copper.)
- McLean-Brandom Oil & Supply Co., 65 Long Wharf, Boston, Mass. "M. & B. Nox-All."
- ★Manufacturers' Supplies Co., 418 Arch St., Phila., Pa. "Velox."
- Marshall Oil Co., Marshalltown, Ia. "French."
- Matchless Metal Polish Co., N. Y. City. "Matchless," "Tripoline" & "Mexoline."
- Missouri Chemical Co., Holden, Mo. "B-Brite."
- Modoc Co., The, Fernwood, Pa. "Modoc." (Brass.)
- Monahan Antiseptic Co., 100 Market St., Chicago, Ill.
- Mooney, A. J., 359-63 Ninth Ave., N. Y. City. "Golden Glitter" & "Cream Liquid."
- ★New Jersey Paint Works, Wayne & Fremont Sts., Jersey City, N. J. "New Jersey" & "Bertram."
- New York Oil & Paint Co., 128 Maiden Lane, N. Y. City. "Handy."
- NoXal Polish Mfg. Co., 1238-44 Belmont Ave., Phila., Pa. "NoXal."
- Panama Oil & Grease Co., 159 W. 51st St., N. Y. City. (Liquid & paste.)
- Paul, J. C. & Co., 59 Dearborn St., Chicago, Ill. "Auto Shine," "Burnishine" & "Putz Pomade."
- Raimes & Co., 50 Ferry St., N. Y. City. "Globe."
- ★Rath, Chas. H., Inc., 1347 N. Front St., Phila., Pa. "A-1."
- Rath Mfg. Co., Hancock & Hedley Sts., Phila., Pa. "Imperial," "Golden Sceptre" & "Staraline."
- Reid, W. W. Mfg. Co., 131 State St., Boston, Mass. "Reid's Putz" & "Reed's Putz Pomade."
- Rex Chemical Co., 104 S. Howard St., Baltimore, Md. "Crown," "Vels-ma" & "Marvel."
- Robertson & Co., 1061 W. Madison St., Chicago, Ill. "Robertson's Red Cross Brand."
- Rostand Mfg. Co., Milford, Conn. "Yale."
- Royal Lubricating Oil Co., 116 Broad St., N. Y. City. "Royal" & "Monogram."
- St. Louis Surfacers & Paint Co., St. Louis, Mo. "Koonshine."
- Schmoeger, F. A., Sterling, Ill. "Magiclean."
- Sheppard, W. S., 22 Lawrence St., Newark, N. J. "Prestoshine."
- Shi-Nal Co., 413 Emmet Road, Toledo, Ohio. "Golden Glow" & "N-Dur-al."
- Skat Mfg. Co., Hartford, Conn.
- Sonneborn, L. Sons, 262 Pearl St., N. Y. City. "Amalie."
- Speare's, The Alden Sons Co., 369 Atlantic Ave., Boston, Mass.
- Standard Leather Washer Mfg. Co., 24-25 Boudinot St., Newark, N. J. "Lustral."
- Stanley, John T., 650 W. 30th St., N. Y. City. "Hyglo."
- Stevens, Frederick B., Detroit, Mich. "Columbia."
- Stinson, B. F. Co., 424 Niagara St., Buffalo, N. Y. "Easybright."
- Sweet, Charles F., Inc., 20 Ford St., Hartford, Conn. "Magic."



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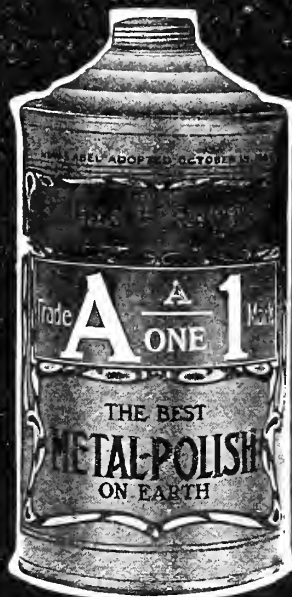
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A Thick Oil Cream Polish

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Leaves no SEDIMENT or POWDER. Will not harden the metal. Surpasses all others for Quick Action—Brilliancy—Lasting Lustre. Ask your dealer or write for sample.

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*JOBBERS AND DISTRIBUTORS:*



Akron, Ohio—Akron Auto & Supply Co.  
Austin, Texas—Webb, Taylor & Perry  
Atlanta, Ga.—Alexander-Seewald Co.  
Baltimore, Md.—Chas. A. Miles, 117 N. Green St.  
Birmingham, Ala.—C. C. Nixon  
Brooklyn, N. Y.—Jullus Bludrin  
Buffalo, N. Y.—M. Scherer, 334 Johnson St.  
Cleveland, Ohio—H. F. Reid, 1718 Crawford Road  
Cleveland, Ohio—Pennsylvania Rubber & Supply Co.  
Columbus, Ohio—Early Motor Car Co., Motor Supply Co.  
Chicago, Ill.—B. P. McAlees, 1018 La Salle Ave.  
Chicago, Ill.—The Beckley-Ralston Co., Excelsior Supply Co.;  
The Automobile Supply Co.; Motor Car Supply Co.;  
Franco-American Auto & Supply Co.  
Cincinnati, Ohio—The Ball-Flintze Co.; Leyman-Bulck Co.  
Cedar Falls, Iowa—Rice & Dayton Mfg. Co.  
Detroit, Mich.—The Automobile Equipment Co.  
Dallas, Texas—Appel & Burwell Rubber & Tire Co.  
Houston & Dallas, Texas—Shelp Rubber & Supply Co.; Bulck Auto Co.  
Indianapolis, Ind.—Hearsey-Willis Co.; Willis-Holcomb Co.;  
Gibson Auto Co.; Indiana Auto Co.; Guarantee Tire & Bicycle Co.  
Jacksonville, Fla.—Fred E. Gilbert  
Kansas City, Mo.—Auto Specialty Co.; Mercantile Lumber & Supply Co.; The Monarch Motor Car Co.; Kansas City Auto Supply Co.  
Oxville, Tenn.—S. B. Luttrell & Co.  
on, England—Cloud & Co., Ltd.

Lincoln, Neb.—Nebraska Spark Auto Co.  
Lansing, Mich.—Never-Miss Spark Plug Co.  
Memphis, Tenn.—Jerome P. Parker & Co.  
Minneapolis, Minn.—Williams-Gallagher Co.; Northwestern Auto Co.; Fawkes Auto Co.  
Newark, Ohio—The Ball-Flintze Co.  
New Orleans, La.—Russell Motor Car Co.; Shuler Rubber & Supply Co.  
New York City—W. A. Blackburn, 409 East 69th St.  
New York City—Cook & Cokelair, 306 Pearl St., Exporters;  
Wm. J. Gasser, 136 Liberty St.  
Omaha, Neb.—Powell Supply Co.  
Oklahoma City, Okla.—Severin Auto Co.  
Peoria, Ill.—M. M. Baker & Co.  
Philadelphia, Pa.—J. Wm. Nock, 126 N. Fourth St.  
Pittsburg, Pa.—Joseph Woodwell Co.; Pittsburg Auto Equipment Co.  
Portland, Oregon—The A. J. Winters Co., 67 Sixth St.  
St. Louis, Mo.—Neustadt Auto & Supply Co.; Behen-Faught Motor Car Equipment Co.  
St. Paul, Minn.—C. J. Smith & Co.; C. P. Joy Auto Co.; Farwell, Ozmun, Kirk & Co.  
San Francisco, Cal.—Pacific Sales Corporation.  
Syracuse, N. Y.—C. E. Mills Oil Co.  
Seattle, Wash.—F. Fischbeck, 312 E. Pike St.; Hatch & Dodd, 914 E. Pike St.  
Tampa, Fla.—Florida Gas Engine & Supply Co.  
Toledo, Ohio—Union Supply Co.  
Washington, D. C.—Geo. E. Reed, 1314-16 New York Ave.  
Worcester, Mass.—Alston & Goulding



**METAL POLISH—Continued**

- 3-in-One Oil Co., 42 Broadway, N. Y. City.  
 "R. R." & "3-in-1."  
 Tanite Co., The, Stroudsburg, Pa. "Tanite."  
 (Polishing paste.)  
 Trafton, F. M. Co., 176 Federal St., Boston,  
 Mass.  
 Two-Rub Metal Polish, Co., St. Louis, Mo.  
 "Two-Rub."  
 Ulrich & Co., 227-33 E. North St., Buffalo, N.  
 Y. "A-O-K," "Raydo" & "Buffalo."  
 Uncle Sam Polish Co., 335 Monroe Ave., De-  
 troit, Mich. "Uncle Sam."  
 U. S. Metal Polish Co., Indianapolis, Ind.  
 United Supply Agency, 912 Westminster St.,  
 Providence, R. I. "Shinebright."  
 Utility Co., The, 636-8 W. 44th St., N. Y.  
 City. "Utility." (Powder.)  
 ★Vanguard Mfg. Co., Washington & Desplaines  
 Sts., Joliet, Ill. "Vanguard."  
 Vita Mfg. Co., 1151-57 Stanford Ave., Los An-  
 geles, Cal.  
 Western Robe Mills, 43 Peck St., Chicago, Ill.  
 Young, Orlando W., 174-80 Frelinghuysen Ave.,  
 Newark, N. J.

**METERS, Miscellaneous**

- (See also Ammeters, Voltmeters, Grade  
 Meters, etc.)  
 Morss Co., A. S., 210-212 Commercial St., Bos-  
 ton, Mass. "Morss." (Pitchometer, ma-  
 rine.)  
 Read-Rite Meter Works, 14 Main St., Bluff-  
 ton, O. "Readrite." (Small switchboard.)  
 Sangamo Electric Co., Springfield, Ill. "San-  
 gamo" (ampere-hour.)  
 Tagliabue, C. J. Mfg. Co., 53 Fulton St., N. Y.  
 City. "Kno-Freeze-Meter." (Radiator so-  
 lution meter.)  
 Weston Electric Instrument Co., Waverly  
 Park, Newark, N. J. "Weston." (Elec-  
 trical measuring.)

**MICA**

(See Insulation.)

**MIRRORS, Dashboard**

- Adapt Machinery Co., 1620-1630 Wabash Ave.,  
 Chicago, Ill.  
 Alexander, The J. Co., 1931 Broadway, N. Y.  
 City. "Mirroscope."  
 ★American Thermo-Ware Co., 16 Warren St.,  
 N. Y. City. "Autocrat." (Imported.)  
 Balzer, Gus, 1777-79 Broadway, N. Y. City.  
 ★Cowles, C. & Co., Water & Chestnut Sts., New  
 Haven, Conn.  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert  
 Sts., Albany, N. Y. "The Cox Reflector-  
 scope."

- Eckstein, W. F., 1223 Michigan Ave., Chicago,  
 Ill. "Friday's."  
 Knight, H. C. & Co., 1725 Michigan Ave.,  
 Chicago, Ill.  
 Motor Car Equipment Co., The, 55 Warren  
 St., N. Y. City. "Argus." (Imported.)  
 Novelty Mfg. Co., The, Maple St., Waterbury,  
 Conn. "Bellamy."  
 Western Mechanical Works, 1138 S. Main St.,  
 Los Angeles, Cal. "Western."

**MIRRORS & REFLECTORS,  
Lamp**

- (See also Lamp lenses.)  
 Bausch & Lomb Optical Co., Rochester, N. Y.  
 "Bausch & Lomb." (Mangin.)  
 Carlisle & Finch Co., 229 E. Clifton Ave., Cin-  
 cinnati, O.  
 ★Excelsior Supply Co., 233-237 Randolph St.,  
 Chicago, Ill. (Reflectors.)  
 Fowler Lamp & Mfg. Co., 2337 Wabash Ave.,  
 Chicago, Ill.  
 Fry, H. C. Glass Co., Rochester, Pa.  
 Macbeth-Evans Glass Co., Pittsburg, Pa.  
 "Pearl Glass."  
 ★Matisse, C. & A., 543-549 E. 116th St., N. Y.  
 City. (Mangin.)  
 Prismatic Reflector Co., 302 Electric Bldg.,  
 Cleveland, Ohio. (Prismatic lamp reflec-  
 tors.)  
 Rumsey Electric Company, 327 Jefferson Ave.,  
 Detroit, Mich. (For electric lights.)  
 Scheidig, John & Co., 56 Maiden Lane, N. Y.  
 City.  
 Sprague-Waldo Mfg. Co., 18 Piquette Ave., E.,  
 Detroit, Mich. (Reflectors.)

**MISCELLANEOUS ARTICLES,  
Automobile**

- Allen Fire Dept. Supply Co., Eddy St., Provi-  
 dence, R. I. (Fire extinguisher brackets  
 & holders.)  
 American Thermos Bottle Co., N. Y. City.  
 (Thermo bottle cases.)  
 Barnard Specialty Co., 500 H. W., Hellman  
 Bldg., Los Angeles, Cal. "Barnard."  
 (Safety match box.)  
 Continental Rubber Works, Erie, Pa. (Rubber  
 rings, rolls & sheet rubber.)  
 Crosby Steam Gauge & Valve Co., 97 Oliver  
 St., Boston, Mass. (Steam specialties.)  
 Dean, John Mfg. Co., Racine, Wis. "Racine."  
 (Attachable match flare.)  
 ★Douglas & Lomason Co., 302-310 Grand Ri-  
 ver Ave., Detroit, Mich. (Mat binding.)  
 Forg, Peter, 50 Park St., Somerville, Mass.  
 (Valve wheels.)  
 Hartford Rubber Works Co., 691 Park St.,  
 Hartford, Conn. "Hartford." (Hood Anti-  
 Rattler.)  
 Kaufman, A. G. Mfg. Co., Inc., 131-133 Reade  
 St., N. Y. City. "Kaufman Bottomless."  
 (Bunsen burners & automatic shut-offs for  
 brazing & soldering torches.)  
 Liquid Carbonic Co., 67 Wells St., Chicago,  
 Ill. (Liquid gas for tire inflation.)

**MISCELLANEOUS ARTICLES, Automobile**  
—Continued

Mattson Rubber Co., Lodi, N. J. (Small rubber buttons, bead strips, sheet rubber slabs & molded rubber goods of all kinds.)

Metal Hardening Solution Co., Rochester, N. Y. "Kalux." (Steel hardening & tempering solution for increasing the efficiency of all carbon steel tools.)

Nuttall, R. D. Co., 925 Fayette St., Pittsburgh, Pa. "Nuttall." (Flexible couplings.)

O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil." (Air bags.)

Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J. (Clock cases & eagles.)

Robeson Process Co., Au Sable Forks, N. Y. "Robeson." (Glutrin for road making.)

★Rohrbacher Automatic Air Pump Co., 173 E. Water St., Portland, Ore. "Rohrbacher."

Stafford, N. Co., 67 Fulton St., N. Y. City. (Badges, medals, time checks, stamps, burning brands, etc.)

Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Eyelets, grommets & washers.)

Toledo Metal Wheel Co., Toledo, O. "Peerless," "Favorite" & "Perfection." (Juvenile foot & hand propelled vehicles.)

Union Paper & Twine Co., 45 Larnard St., W., Detroit, Mich. ("Kraftwrap" paper for wrapping tires; "Keepdry" waterproof material for wrapping tires or other articles.)

Weiss, Chas. & Son, 4800 Cottage Grove Ave., Chicago, Ill. (Inside black auto top dye.)

Westinghouse Air Brake Co., Pittsburgh, Pa. (Governors for air compressors.)

*Shine Up!***REX METAL CREAM POLISH****Armiger Chemical Company**

2155-2157 Austin Avenue

Chicago, Illinois

**Once Tried Always Used****WHIZ****Metal Polish**

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A creamy, pink colored emulsion,  
quick in action, a lasting lustre, ABSO-  
LUTELY FREE OF ACIDS.

We manufacture under the WHIZ Brand a full line of Lubricating Oils, Greases, Soaps, Graphites, Anti-Freezing Compounds, Rubber Cements, Carbon Decomposer, Valve Grinding Compounds, etc.

**THE R. M. HOLLINGSHEAD CO.**

Ninth and Market Streets, Camden, N. J.

**MIXING VALVES, GENERATOR VALVES & VAPORIZERS**

(See also Carburetors.)

- Barker, C. L., Norwalk, Conn.  
 Garlock Auto Specialty Co., Palmyra, N. Y.  
 "Whiting Airburetor-Mixer."  
 Generator Valve Co., 294-296 Taaffe Place,  
 Brooklyn, N. Y. "Excelsior."  
 ★Gyrex Mfg. Co., 1777 Broadway, N. Y. City.  
 "Gyrex." (Mixers.)  
 Hilaman, A. L. Co., Moorestown, N. J. "Hila-  
 man."  
 Lavigne Mfg. Co., Commonwealth Ave. &  
 Railroad, Detroit, Mich. "Lavigne."  
 ★Lunkenheimer Co., The, Cincinnati, O. "Non-  
 pareil." (Mixing & generator valves.)  
 Monarch Valve Co., 112 Front St., Brooklyn,  
 N. Y.  
 Pioneer Iron Works, Antigo, Wis. "Morgan."  
 Raimes & Co., 50 Ferry St., N. Y. City. "Erick-  
 son." (Gasoline mixers.)

**MONOGRAMS**

- Abbott, W. H., 143 W. 42nd St., N. Y. City.  
 Balzer, Gus, 1777-79 Broadway, N. Y. City.  
 (Also crests.)  
 Baum's Brass & Model Works, 244 Third Ave.,  
 S. Minneapolis, Minn.  
 Bernard, J. Co., 477-79 Tenth Ave., N. Y. City.  
 Blackington, V. H. & Co., Attleboro Falls,  
 Mass.  
 Chicago Art Metal Works, 67 Lake St., Chi-  
 cago, Ill. (And initial letters.)  
 Childs, S. D. & Co., 200 Clark St., Chicago,  
 Ill.  
 Colgan, The J. W. Co., 509 Sudbury Bldg.,  
 Boston, Mass. "Colgan's."

- Detroit Rubber Stamp Co., 99 Griswold St., De-  
 troit, Mich.  
 Etching Co. of America, 2526-28 W. Congress  
 St., Chicago, Ill.  
 Fine, Horace E. Co., 19 E. State St., Trenton,  
 N. J.  
 Greenduck Co., 200 S. Clinton St., Chicago, Ill.  
 ★Hancock Mfg. Co., 776 E. Henry St., Char-  
 lotte, Mich.  
 ★Hickok Mfg. Co., The, Rochester, N. Y.  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St.,  
 Chicago, Ill.  
 Johnston, J. G. & Co., 20 Brattle Sq., Boston,  
 Mass.  
 Mulhaupt, F. Jos., 227 N. 5th St., La Fayette,  
 Ind.  
 Murdock, The James, Jr. & Co., 112 Opera  
 Place, Cincinnati, O.  
 Newark Brass Plate Engraving Co., 45 Law-  
 rence St., Newark, N. J.  
 Rees, F. H., Steele Memorial Bldg., Elmira,  
 N. Y.  
 Salman, J. A. & Co., 17 Bromfield St., Boston,  
 Mass.  
 Schridde, William, 35 S. Clark St., Chicago,  
 Ill.  
 Schwerdtle Stamp Co., 39-41 Cannon St.,  
 Bridgeport, Conn.  
 Stafford, N. Co., 67 Fulton St., N. Y. City.  
 Turner Brass Works, The, Sycamore, Ill.  
 ★Walter, N. C. & Sons, 194 William St., N. Y.  
 City.  
 Western Mechanical Works, 1138 S. Main St.,  
 Los Angeles, Cal.  
 Whiteford, Jos. G. & Co., 165 N. Jefferson  
 St., Chicago, Ill.

**MOTOR CYCLE ENGINES**

(See Cycle Motors.)

# GYREX

• THE MIXER •

**THE** Perforated Turbine  
 breaks up gasoline spray  
 in the intake pipe and gives  
 uniform, quick-firing mixture.

**PRODUCES**

Complete Combustion  
 Flexibility  
 Steady Torque  
 Efficiency

**ELIMINATES**

Overheating  
 Vibration  
 Back-Firing  
 Carbonizing  
 Sooting and Smoke

**Excessive Gasoline Bills**

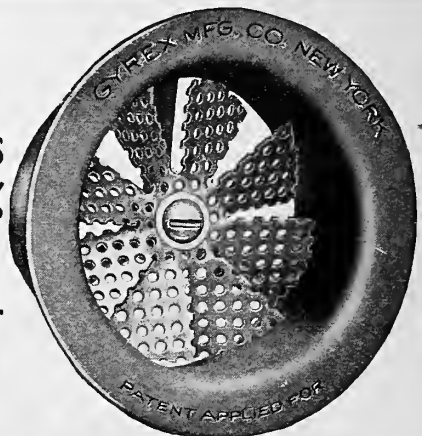
Saves its cost in 50 gallons

## All Standard Sizes

## Price, \$3.00

Inserted in any motor in five minutes

Saves  
 20 %  
 of  
 Gaso-  
 line



Add  
 15 %  
 to  
 Pow

## Gyrex Mfg. Company

1777 Broadway :: New York City

★ indicates Advertisers—see Index in back of book.

# MOTOR VS. CARBURETER

## *Complaint.*

No matter how much money and care  
A manufacturer may put into the construction of his MOTOR,  
The moment he attempts to demonstrate its Power, Smoothness and Flexibility  
He is at the mercy of a CARBURETER.  
And, more's the pity—*a carbureter that does not carburet.*

TO CARBURET, means to impregnate the air with gasoline.  
Air cannot be carbureted, unless the hydro-carbon is Evaporated.  
Gasoline will Evaporate through absorption by the air—  
It will Evaporate more rapidly if agitated.  
The more violent the agitation—the more rapid the Evaporation.  
Carbureters furnish a stream of gasoline spray and air.  
Carbureters do not agitate.  
Therefore, *carbureters do not carburet.*

Perfect combustion depends upon correct proportions of gasoline vapor and air,  
And the two, being *evenly mixed*.  
How are the two elements to be evenly mixed—  
Unless every bit of air be impregnated with gasoline, and  
How can every bit of air be impregnated—  
Unless the gasoline be Evaporated and Diffused and Beaten into it?  
How can gasoline be Evaporated and Diffused and Beaten into the air?  
Unless there be *violent mechanical agitation*  
While the gasoline spray and air are passing through in correct proportions?  
How can such Mechanical Agitation be obtained?  
By inserting a **HOMO** between the carbureter and the intake manifold.

**Makes a 4-Cylinder Run Like a 6-Cylinder  
on the Gasoline Consumed by a 2-Cylinder**

## **H O M O**

**GASOLINE MOTOR EFFICIENCY CO., 98 Hudson St., Jersey City, N. J.**

**MOTOR CYCLE PARTS, Miscellaneous**

- ★Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill. "Thor."
- Baker & Co., F. A., 37 Warren St., New York City.
- ★Eclipse Machine Co., Elmira, N. Y. "Eclipse." (Cranks.)
- Geer, Harry R. Co., 856 McLaren St., St. Louis, Mo.
- ★Greyhound Motor Works, 1443 Niagara St., Buffalo, N. Y. "Greyhound" & "Auto-Bi."
- ★New York Sporting Goods Co., 15-17 Warren St., N. Y. City.
- Persons Mfg. Co., 54-68 Bloomingdale Road, Worcester, Mass. "Kach Klipx." (Pedal catcher.)
- S. D. Mfg. Co., 155 Ridgewood Ave., Brooklyn, N. Y.
- Thiem Mfg. Co., The, Minneapolis, Minn. "Thiem."

**MOTORS, Alcohol Marine**

(See Marine Motors, Alcohol.)

**MOTORS, Electric**

(See Electric Motors.)

**MOTORS, Gasoline Automobile**

(See Gasoline Automobile Motors.)

**MOTORS, Gasoline Marine**

(See Marine Motors, Gasoline.)

**MOTORS, Kerosene Marine**

(See Marine Motors, Kerosene.)

**MOTORS, Steam**

(See Steam Automobile Motors &amp; Marine Engine, Steam.)

**MOUNTINGS, Automobile**

- Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, Ohio. (And small brass parts.)
- Amesbury Brass & Foundry Co., Amesbury, Mass.

- Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich.
- ★Bridgeport Brass Co., Corner Fairfield & Holland Aves., Bridgeport, Conn. (Brass running board & wind shield moulding.)
- Conestoga Bending Works, 547-49 N. Market St., Lancaster, Pa. (Rails.)
- ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. (Metal, ivory & horn.)
- Curry & Abeles, 229 Mulberry St., Newark, N. J. (And brass mouldings.)
- ★Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich. (Mouldings.)
- English & Mersick Co., The, 122-26 Winchester Ave., New Haven, Conn.
- English & Mersick Lamp & Foundry Co., 129-131 Park St., New Haven, Conn. (Step board, heel board & tool box mountings.)
- ★French Mfg. Co., The, 136 Robbins St., Waterbury, Conn. (Mouldings for wind shields, dash & running board.)
- Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp." (To order.)
- ★Jonah & George, Merrimac, Mass. (Mouldings.)
- Keeler Brass Co., Grand Rapids, Mich.
- Kinsey Mfg. Co., Toledo, Ohio. "Kinwood." (Brass mouldings for steps, battery & tool boxes.)
- Lockwood & Co., 34 Mechanic St., Newark, N. J. (Mouldings.)
- McKenna Bros. Brass Co., First Ave. & Ross St., Pittsburg, Pa. (Brass railings.)
- ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. (Brass & steel mouldings.)
- Murdock, The, James, Jr. Co., 112 Opera Pl., Cincinnati, O. (Metal rails & trimmings.)
- Murphy, The G. W. J. Co., Merrimac, Mass. "Murphy." (Brass & silver mouldings.)
- Novelty Mfg. Co., The, Waterbury, Conn. (Also mouldings.)
- O'Brien, Jos. F. Co., 63 Park Pl., N. Y. City.
- ★Ohio Brass Co., Mansfield, Ohio. (Hand rails, to order.)
- Perpente Mfg. Co., State & Wall Sts., New Haven, Conn.
- Phoenix Lock Works, 321 3rd Ave., Newark, N. J. (Brass & bronze.)
- Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich. (Brass and nicked rails.)
- Ritter Mfg. Co., 63-69 Amsterdam St., Detroit, Mich. (Brass.)
- Rogers, E. F. & Co., 410 Arch St., Phila., Pa. (Brass.)
- ★Smith, Jos. N. Co., Fourth & Porter Sts., Detroit, Mich. (Brass & nickel rails, "Perfection," mouldings for dash & running boards.)
- Taylor, H. D. Co., 101-105 Oak St., Buffalo, N. Y.
- Turner Brass Works, The, Sycamore, Ill.
- ★White Mfg. Co., 155 Cannon St., Bridgeport, Conn. (Mouldings.)
- Woodruff, Walter W. & Sons Co., Mt. Carmel, Conn. (Also Mouldings.)

**MOUNTINGS, Boat**

- Bryant & Berry Co., 32-36 Atwater St., W., Detroit, Mich. (Brass.)

**MUD APRONS**

(See Dust &amp; Mud Shields.)

★ indicates Advertisers—see Index in back of book.

**MUD GUARDS, Auto**

- A-Z Co., The, 527-29 W. 56th St., N. Y. City.  
"A-Z."  
Acme Veneer & Body Co., Rahway, N. J.  
(Metal.)  
Adapt Machinery Co., 1620-1630 Wabash Ave.,  
Chicago, Ill.  
Aepinus-Haggstrom Mfg. Co., 1502 Michigan  
Ave., Chicago, Ill.  
American Veneer Co., 100 Market St., Kenil-  
worth, N. J.  
Amesbury Metal Body Co., Amesbury, Mass.  
Auto Body Co., Lansing, Mich.  
Auto Radiator Repairing Co., 1317 Vine St.,  
Phila., Pa.  
Auto Re-Building Co., 1307-09 Wabash Ave.,  
Chicago, Ill. "Arco."  
Auto Sheet Metal Works, 2228 Michigan Ave.,  
Chicago, Ill.  
Badger, E. B. & Sons Co., 63 Pitts St., Bos-  
ton, Mass.  
Berger Mfg. Co., Canton, Ohio.  
Briscoe Mfg. Co., 1127-57 Woodward Ave.,  
Detroit, Mich.  
Bush Mfg. Co., 81 Commercial St., Hartford,  
Conn. "Bush."  
Clayton's, Frank B. Sons, 1222-24 Race St.,  
Phila., Pa.  
Columbus Auto Brass Co., The, 181 W. Maple  
St., Columbus, O.  
Dann Bros. & Co., The, 80-86 Franklin St.,  
New Haven, Conn. (Wood.)  
Delmar Auto Body & Wheel Co., Indianapolis,  
Ind.  
Detroit Auto Specialty Co., 909 Greenwood  
Ave., Detroit, Mich.  
Dunham, D. B. & Co., 128-132 Irving St.,  
Rahway, N. J.  
★Fedders Mfg. Co., 57-59 Tonawanda St., Buf-  
falo, N. Y. "Fedders."  
Fickling & Co., Inc., 304-306 W. 49th St.,  
N. Y. City.  
Fleetwood Metal Body Co., Fleetwood, Pa.  
"Fleetwood."  
Folsom, C. G. Mfg. Co., South Bend, Ind.  
Gender, Paeschke & Frey Co., St. Paul Ave.  
& 15th St., Milwaukee, Wis.  
★Globe Machine & Stamping Co., 3950 Hamil-  
ton Ave., N. E., Cleveland, Ohio.  
Graves & Congdon Co., Carriage Ave., Ames-  
bury, Mass.  
★Hancock Mfg. Co., 770 Henry St., Charlotte,  
Mich.  
Hayes Mfg. Co., Maybury Grand Ave. & G.  
T. Ry., Detroit, Mich.  
Kells, W. J. Mfg. Co., 726-28 Eleventh Ave.,  
N. Y. City.  
Keystone Sheet Metal Co., Ambridge, Pa.  
Kinsey Mfg. Co., Toledo, Ohio. "Kinwood."  
Lockport Stamping Co., Race St., Lockport,  
N. Y. "Lockport."  
★Long Mfg. Co., 1430-34 Michigan Ave., Chi-  
cago, Ill.  
McKinnon Dash Co., Amherst St., Buffalo,

N. Y. "McKinnon."

- ★Mayo Radiator Co., The, State & Mill River  
Sts., New Haven, Conn. "Mayo."  
★Metal Stamping Co., Jackson, Mich.  
Mullins, W. H. Co., Salem, Ohio. (Metal)  
New Britain Sheet Metal Co., New Britain,  
Conn.  
Novelty Mfg. Co., Jackson, Mich. "Novelty."  
Noye Mfg. Co., Buffalo, N. Y.  
Ohio Blower Co., The, 324-332 Prospect Ave.,  
N. W., Cleveland, O.  
Paragon Auto Parts Co., The, 1709-1711 Broad-  
way, N. Y. City.  
Quinby, J. M. & Co., 21-39 Division St., New-  
ark, N. J. (Aluminum.)  
Racine Mfg. Co., Racine, Wis.  
Reliable Radiator Co., Inc., 451 E. 173rd St.,  
N. Y. City.  
Reliance Auto Parts Mfg. Co., 244-50 W. 49th  
St., N. Y. City.  
Sheet Metal Auto Parts Works, 201 W. 48th  
St., N. Y. City.  
Springfield Metal Body Co., 364 Birnie Ave.,  
Springfield, Mass. (Aluminum & steel.)  
Steiner Mfg. Co., 144-46 Howard Ave., New-  
ark, N. J.  
Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
Sutherland, The F. L. Co., Detroit, Mich.  
U. S. Dash & Fender Co., The, 127 W. 49th  
St., N. Y. City.  
Wood, Frederick R. & Son, 217 W. 19th St.,  
N. Y. City.  
Wright Cooler & Hood Mfg. Co., 1545 Mich-  
igan Ave., Chicago, Ill.

**MUD GUARDS, Cycle and Motor  
Cycle**

Mott Wheel Works, Pleasant St., Utica, N. Y.

**MUD GUARD ATTACHMENTS,  
Cycle**Clark, A. N. & Son, Plainville, Conn.  
Forsyth Manufacturing Co., 308-314 Terrace,  
Buffalo, N. Y.

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Articles made exclusively for individual manufacturers:

Carriage type of Lamps for Limousines, Broughams and Taxicabs. Electric Cigar Lighters,  
Push Button Switches, Security Locking Handles. Electric Megaphone Speaking  
Tubes, Dome Lights and Batteries, Corner Lights. Door and Grab Handles.  
Tucker's Anti-Rattlers. Top Hardware. Annunciators. Banner  
Window Lock and Anti-Rattler. Tail Lights, Curtain Rollers, Moulding.  
Toilet Cases made to special design.

**C. COWLES & CO.,****NEW HAVEN, CONN.**

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**MUD GUARD FITTINGS, Auto**

Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Fastener.)  
 Cortland Forging Co., Cortland, N. Y. (Irons.)  
 Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich. (Irons.)

**MUFFS, Foot & Steering Wheel**

American Buffalo Robe Co., Buffalo, N. Y. (Foot.)  
 Mandeville Steering Wheel Muff Co., The, Bluffton, Ind. (Steering wheel.)

**MUFFLERS, Chest and Throat**

(See Clothing.)

**MUFFLERS, Exhaust**

A. Z. Co., The, 527-529 W. 56th St., N. Y. City. "A-Z."  
 Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.  
 ★Anderson Motor Co., The, 16th & Jackson Sts., Anderson, Ind. "Anderson."  
 ★Atlas Stamping Co., 557-61 Jackson Blvd., Chicago, Ill.  
 Auto & Power Appliance Co., The, 357-59 The Arcade, Cleveland, O.  
 ★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. "Brennan."  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 Byrne, Kingston & Co., Kokomo, Ind. "Kingston." (And cutouts combined.)  
 Clayton's, Frank B. Sons, 1222-24 Race St., Phila., Pa.  
 Friction Fibre Co., 574 12th St., Milwaukee, Wis.  
 Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo. (Motorcycle.)  
 Gem Mfg. Co., Chelsea Station, Boston, Mass.  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, Ohio.  
 Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich. (Marine.)  
 ★Gray-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich. "Gray." (Auto & marine.)  
 Grubb, Charles Edmund, 819 Fourth Ave., Altoona, Pa.  
 H. Brothers, The, 207 43rd Court, Chicago, Ill. "HB."  
 Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-man-co."  
 Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich.  
 Holmes, Chas. Machine Co., Cambridgeport, Mass.  
 Kells, W. J. Mfg. Co., 726-28 Eleventh Ave., N. Y. City.  
 Kinsey Mfg. Co., Toledo, Ohio. "Kinwood."  
 Koven, L. O. & Bro., 50 Cliff St., N. Y. City. "Koven." (Boat.)  
 Long Bros., Broadway & Buckeye St., Kokomo, Ind.  
 Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Radium."

Motor & Mfg. Works Co., The, Foot of Middle St., Geneva, N. Y. "Ejector."  
 ★Motsinger Device Mfg. Co., Pendleton, Ind. "Motsinger."  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 New Britain Sheet Metal Co., New Britain, Conn.  
 Ohio Blower Co., 324-332 Prospect Ave., N. W., Cleveland, Ohio.  
 Oldberg Mfg. Co., Detroit, Mich. "Oldberg."  
 Perkins Wheel Co., Grand Rapids, Mich. (Motor boat.)  
 Powell Muffler & Timer Co., Utica, N. Y. "Powell."  
 Reliance Auto Parts Mfg. Co., 244-50 W. 49th St., N. Y. City.  
 Ross & Browne, 6127 Cottage Grove Ave., Chicago, Ill.  
 Sanford, F. C. Mfg. Co., Bridgeport, Conn.  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.  
 Snow, B. W. Co., The, 132 Bissell St., Syracuse, N. Y.  
 Weeber, C. F. Mfg. Co., 170-172 Central Ave., Albany, N. Y. "Weeber."  
 Xargil Mfg. Co., 36-44 Broadway, Utica, N. Y. "Xargil." (Vacuum.)

**MUFFLER CUT-OUTS**

Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco." (Also chime valves.)  
 Capitol Hill Garage Co., The, 821 Corona St., Denver, Colo. "Scott."  
 Echo Horn Co., The, 5601 Carnegie Ave., Cleveland, O. "Echo."  
 Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill. "Rudic."  
 ★Gabriel Horn Mfg. Co., 1407 E. 40th St., Cleveland, O. "Gabriel."  
 ★Gray-Hawley Mfg. Co., 605-609 Fort St., West, Detroit, Mich. "Gray."  
 Kinsey Mfg. Co., Dayton, Ohio.  
 M. A. M. Mfg. Co., 257 W. Exchange St., Providence, R. I. "Manco."  
 Machine Accessories & Novelties Mfg. Co., 257 West Exchange St., Providence, R. I.  
 ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I.  
 Motor & Mfg. Works Co., The, Foot of Middle St., Geneva, N. Y.  
 ★Motsinger Device Mfg. Co., Pendleton, Ind. "Motsinger."  
 Noonan Tool & Machine Works, 103½-5 Dominick St., Rome, N. Y.  
 Oldberg Mfg. Co., Detroit, Mich. "Oldberg."  
 Powell Muffler & Timer Co., Utica, N. Y.  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.  
 S. B. R. Specialty Co., The, 1771 Broadway, N. Y. City. "S.B.R."  
 Stryker, C. W., 314 E. Onondaga St., Syracuse, N. Y. "Stryker."  
 Sure Pop Mfg. Co., Fayetteville, N. Y.  
 ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.  
 Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill.

**NAME PLATES**

Abbott, W. H., 143 W. 42nd St., N. Y. City.  
 Aluminum Goods Mfg. Co., Newark, N. J.

★ Indicates Advertisers—see Index in back of book.



# NAME PLATES—Continued

Balzer, Gus, 1777-79 Broadway, N. Y. City.  
 Becker, August Engraving Co., 247 Atlantic Ave., Boston, Mass.  
 Bernard, J. Co., 477-79 Tenth Ave., N. Y. City.  
 Blackington, V. H. & Co., Attleboro Falls, Mass.  
 Buffalo Name Plate Co., Beecher Bldg., Buffalo, N. Y.  
 Chandler Co., Inc., The, 31 Taylor St., Springfield, Mass. (Auto, bl. & machinery.)  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.  
 Childs, S. D. & Co., 200 Clark St., Chicago, Ill.  
 Detroit Rubber Stamp Co., 99 Griswold St., Detroit, Mich.  
 Electro-Chemical Engraving Co., 450-458 18th St., Brooklyn, N. Y.  
 Etching Co. of America, 2526-28 W. Congress St., Chicago, Ill.  
 Ford Metal Specialty Co., 55 State St., Chicago, Ill.  
 Greenduck Co., 200 S. Clinton St., Chicago, Ill. (Also Selden license plates.)  
 Haeusermann Metal Mfg. Co., 242 E. 122d St., N. Y. City. (Etched.)  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. (Name scrolls.)  
 ★Hickok Mfg. Co., Rochester, N. Y.  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Meyercord Co., The, 1107-12 Chamber of Commerce Bldg., Chicago, Ill.  
 Morse, C. H. & Son, 15 S. Water St., Rochester, N. Y.  
 Mulhaupt, F. Jos., 227 N. 5th St., La Fayette, Ind.  
 Murdock, The James Jr. Co., 112 Opera Place, Cincinnati, Ohio.  
 Murdock-Shaw Co., 125 Federal St., Boston, Mass.  
 Ness, Geo. M., Jr., N. Y. City.  
 Newark Brass Plate Engraving Co., 45-49 Lawrence St., Newark, N. J. (Also sill plates.)  
 New York Stencil Works, 100 Nassau St., N. Y. City.  
 Robbins, John Mfg. Co., 58 Kneeland St., Boston, Mass.  
 Rogers, C. E., 34 Beach St., Boston, Mass.  
 Sackmann Mfg. Co., Akron, Ohio.  
 Schridde, Wm., 35 S. Clark St., Chicago, Ill.  
 Schwerdtle Stamp Co., 39-41 Cannon St., Bridgeport, Conn.  
 Shepard Mfg. Co., The, Melrose Highlands, Mass. (Enameled.)  
 Stafford, N. Co., 67 Fulton St., N. Y. City.  
 Torrey Roller Bushing Works, Bath, Me. (Also sill plates.)  
 Turner Brass Works, The, Sycamore, Ill.  
 Wadsworth Engraving Co., Springfield, Ohio.

★Walter, N. C. & Sons, 194 William St., N. Y. City.  
 Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal.  
 Whiteford, Jos. G. & Co., 165 N. Jefferson St., Chicago, Ill.

# NAVAL ARCHITECTS

Atkin-Wheeler, Halesite, Huntington Harbor, L. I., N. Y.  
 Gielow, Henry J., 52 Broadway, N. Y. City.  
 Nock, F. S., East Greenwich, R. I.  
 Whittelsey & Whittelsey, Inc., 11 Broadway, N. Y. City. (And marine engineers.)

# NICKEL STEEL

(See Raw Material.)

# NIPPLE GRIPS, Cycle

Fry, Keyser, 723-25 Chestnut St., Reading, Pa. "Neverslip" & "Baby."  
 Menominee Electric Mfg. Co., Menominee, Mich. (Motorcycle.)

# NON-FREEZING COMPOUNDS

(See Anti-Freezing Compounds.)

# NON-LIQUID OILS

(See Oils.)

# NON-SKIDS

(See Anti-Skids.)

# N. C. WALTER & SONS

194 William St, New York

Manufacturers of

# NAME PLATES

for Automobiles, Bicycles, Carriages and Machinery

Engraving, Die Sinking, Metal Stamping, Fancy Metal Goods, Advertising Novelties, etc.

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## NUMBERS, LAMP

(See Metal Figures.)

## NUMBERS, LICENSE

(See Metal Figures.)

## NUTS AND BOLTS

- American Iron & Steel Mfg. Co., Lebanon, Pa. (Machine bolts.)  
 Anthony Screw Co., 320 Chandler St., Worcester, Mass. (Finished nuts.)  
 Atlas Bolt & Screw Co., 1289 Marquette Road, N. E., Cleveland, Ohio. "Atlas."  
 Bay State Screw Co., Hatfield, Mass.  
 Border Bolt & Nut Lock Co., Richmond, Ind.  
 Chicago Screw Co., 1020-26 Homan Ave., Chicago, Ill.  
 Cincinnati Screw & Tap Co., Twilight, O.  
 Clark Bros. Bolt Co., Milldale, Conn. (Also studs.)  
 Columbus Bolt Works, 162 W. Randolph St., Columbus, Ohio.  
 ★Corbin Screw Corporation, New Britain, Conn.  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "Eagle." (Fancy.)  
 Detroit Screw Works, Detroit, Mich. (Castle nuts & bolts.)  
 Electric Welding Product Co., The, Cleveland, O. (Bolts.)  
 Ellis Mfg. Co., The, Milldale, Conn. (Nuts.)  
 Hartford Machine Screw Co., The, Hartford, Conn. "Hartford."  
 Haskell, Wm. H. Mfg. Co., 451 Main St., Pawtucket, R. I.  
 Hill, Geo. Q. Co., 326 A St., Boston, Mass. (Nuts.)  
 Hoopes & Townsend Co., 1330 Buttonwood St., Phila., Pa.  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Brass.)  
 Ireland & Matthews Mfg. Co., Detroit, Mich. "I & M."  
 Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
 Kirk-Latty Mfg. Co., W. Madison Ave. & W. 48th St., Cleveland, O.  
 La Buire Import Co., 123 W. 68th St., New York, N. Y. (Nuts.)  
 Lamson & Sessions Co., 2188 Scranton Road, Cleveland, O.  
 Michigan Bolt & Nut Works, Foot of Meldrum Ave., Detroit, Mich.  
 ★Michigan Screw Co., Lansing, Mich.  
 ★Milton Mfg. Co., Milton, Pa.

- Moore, The Franklin Co., Winsted, Conn. "Charter Oak." (Bolts.)  
 National-Acme Mfg. Co., Cleveland, Ohio. (Brass nuts, special milled goods made of iron, steel & brass, to order.)  
 ★National Tube Co., Frick Bldg., Pittsburg, Pa. (Nuts.)  
 Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. (Castellated nuts.)  
 New Haven Machine Screw Co., New Haven, Conn.  
 Parker, John L. Co., Worcester, Mass. (Nuts.)  
 Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.  
 Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich.  
 Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.  
 ★Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.  
 St. Louis Screw Co., St. Louis, Mo.  
 Schweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich.  
 Skelly, Thos. P. & Co., 24th St. below Callowhill, Phila., Pa. "Skelly."  
 ★Smith, Jos. N. & Co., 4th & Porter Sts., Detroit, Mich. (Finishing.)  
 Somers, Fittler & Todd Co., 327 Water St., Pittsburg, Pa.  
 Standard Metalwork Co., Thompsonville, Conn. "Div-Plugs." (Split nuts.)  
 Sterling Machine & Stamping Co., Wellington, Ohio. (Brass wing nuts.)  
 Stevens & Co., 375 Broadway, N. Y. City. (Nickel.)  
 Upson Nut Co., Unionville, Conn.  
 W. & S. Mfg. Co., Worcester, Mass.  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass.  
 Western Automatic Machine Screw Co., Elyria, Ohio. (Nuts.)

## ODOMETERS

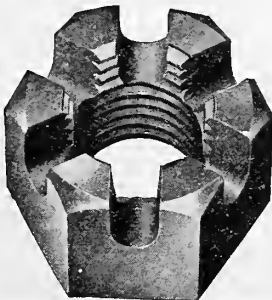
- Electric Speedometer & Dynamometer Mfg. Co., 1317-19 New York Ave., N. W., Washington, D. C. "Dynatak."  
 Jones Speedometer, The, Broadway & 76th St., N. Y. City. "Jones."  
 Recometre Co. of America, 2120 Broadway, N. Y. City. "Recometre."  
 Smith, The R. H. Mfg. Co., Springfield, Mass. "Springfield Motometers."  
 Star Speedometer Co., Danville, Pa. "Star."  
 ★Stewart & Clark Mfg. Co., 1848-60 Diversey Bldg., Chicago, Ill. "Stewart."  
 Veeder Mfg. Co., Sargeant & Garden Sts., Hartford, Conn. "Veeder." (And tachodometers.)

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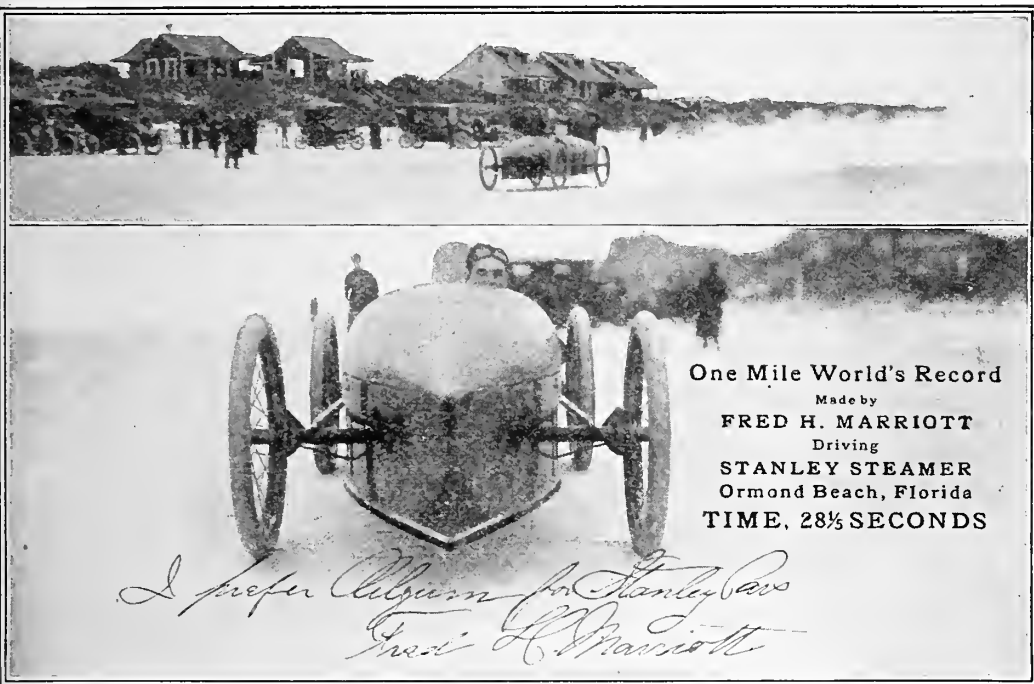


## OILS

- A. & N. Oil Co., 1931 Broadway, N. Y. City. "Peerless."
- Acheson Oildag Co., Niagara Falls, N. Y. "Oildag Paste." (Graphite & oil.)
- Adams Grease & Oil Co., 159 West 51st St., N. Y. City. "Adams."
- Alexander, H. T. & Co., 17 State St., N. Y. City. "Speedway."
- Allen, L. B. Co., Inc., 1353 Columbia Ave., Chicago, Ill. "Allen." (Commutator Lubricant.)
- American Oil Co., 170-78 S. Water St., Jackson, Mich. "Anti Carbon" & "Amoco."
- American Oil & Disinfectant Co., 96 Beekman St., N. Y. City. "Sparrow."
- Atlantic Refining Co., Citizen's Bldg., Cleveland, Ohio. "Arco."
- Automobile Oil Co., 723 Baronne St., New Orleans, La. "Famous."
- Auto Oil Co., 172 S. Water St., Jackson, Mich. "Red Cross."
- Bailey Oil Co., Toledo, Ohio. "Bailey."
- Baker, Wm. T., 228-32 Suydam Ave., Jersey City, N. J. "Paramount."
- ★Baum's Castorine Co., Rome, N. Y. "Baum's," "Baum's Cyloilene" & "Baum's Neatfoot."
- Belden, A. G. & Co., 145 Maiden Lane, N. Y. City. "Valvone."
- ★Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill. "Helmet."
- Borne-Scrymser Co., 80 South St., N. Y. City. "Colonial."
- ★Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. (Cycle.)
- Cataract Refining & Mfg. Co., Buffalo, N. Y. Cincinnati Oil Works Co., The, Cincinnati, Ohio. "Anticarbo."
- Clarkson & Ford Co., 55 Water St., New York City. "Banner."
- Colgan Mfg. & Supply Co., 42 South St., N. Y. City. "Colgan."
- ★Columbia Lubricants Co. of New York, 116 Broad St., N. Y. City. "Monogram."
- Connecticut Oil Co., The, Waterbury, Conn. "Connecticut."
- ★Cook's, Adam Sons, 313 West St., N. Y. City. "Albany."
- Cortland Specialty Co., 176 Railroad St., Cortland, N. Y.
- Crane, L. M. & Co., 91 Oliver St., Boston, Mass. "Crane."
- Crawford, Wm. J. Co., 14 Wood St., Pittsburg, Pa. "Crawford Special."
- Crescent Oil & Grease Co., Cleveland, Ohio. "Franklin."
- Crew-Levick Co., 2231 Land Title Bldg., Phila., Pa. "Perfection."
- Curry Oil & Supply Co., Boston, Mass. ("Coscoleum" auto; "Curry's" motor boat.)
- ★Davey & Co., 2600-08 Grand Ave., Chicago, Ill. "Century."
- Dearborn Drug & Chemical Works, Chicago, Ill. "Fort Putnam" (for gasoline cars) & "Fort Douglas XXX Special" (for steam cars.)
- ★Duryea, Chas. E., Reading, Pa. "Duryaoyl."
- Eagle Lubricating Oil Co., 426-28 First Ave., Pittsburg, Pa.
- Eagle Oil & Supply Co., 104 Broad St., Boston, Mass. "Eagleline" & "No-Karbon."
- Ellis & Cummings Oil Works, Foot of Chestnut St., Reading, Pa. "Argoline."
- Ellis, E. D. Oil Co., 213 Jefferson Ave., Detroit, Mich. "White Royaline" & "Ellis Special."
- Ellsworth & Armstrong Oil Co., 26 Stone St., N. Y. City. "Peerless."
- Energine Refining & Mfg. Co., The, 809 Cuyahoga Bldg., Cleveland, O. (Cylinder.)
- Ensign Refining Co., The, 10605 Quebec Ave., Cleveland, O.
- ★Excelsior Supply Co., 233 Randolph St., Chicago, Ill. "Big 4" & "X.L.C.R."
- Fiske Bros. Refining Co., 24 State St., N. Y. City. "Lubroleine." (Cylinder.)
- Floyd, Frank Harris, 143 Beaubien St., Detroit, Mich.
- Franklin Oil Works, Franklin, Pa. "Earlene," "F.F.," "Zero" & "Keystone." (Cylinder.)
- Frank Oil Co., The, Titusville, Pa.
- Gallaway, G. W., 322 Pearl St., N. Y. City. "Velocity."
- Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo.
- General Oil Works Co., Traction Bldg., Indianapolis, Ind. ("Reliable" cylinder oil & "Reliable Gearaid.")
- Geoghan, A. & Son, Inc., 207 Newell St., Brooklyn, N. Y. "Great Arrow."
- Great Western Oil Co., 2855 E. 37th St., Cleveland, O. "Autoby," "Nokarbo" & "Crown." (Also "Superior" transmission.)
- Greenslade Oil Co., Detroit, Mich. "Packard 24-30." (Cylinder.)
- Harris Oil Co., Muncie, Ind. "Harris Autoil."
- Harris, A. W., Oil Co., 326-328 S. Water St., Providence, R. I. "Harris." (Cylinder.)
- ★Havoline Oil Co., The, 80 Broad St., N. Y. City. "Havoline."
- ★Haws, Geo. A., 73 Pine St., N. Y. City. "Panhard."
- Hinds & Coon, 124-26 Pearl St., Boston, Mass. "Ruby" & "Compounder."
- Hofmeister, Leo Co., 396-98 Clinton St., Milwaukee, Wis. "A-B-C."
- ★Hollingshead, The R. M. Co., Camden, N. J. "Castor," "Whizoil."
- Houghton, E. F. & Co., 240 W. Somerset St., Phila., Pa. "Motoline."
- Kellogg, E. H. & Co., 243 South St., N. Y. City. "Anti-Friction Auto Lubricant" & "Anti-Corrosive Gas Engine Lubricant."
- Kellom, Chas. F. & Co., 113 Arch St., Phila., Pa. "Invader."
- Kenney, F. Mfg. Co., 360-368 Dorchester Ave., Boston, Mass.
- ★Keystone Lubricating Co., 20th St. & Allegheny Ave., Phila., Pa. "Keystone."
- Keystone Oil & Supply Co., Inc., Pittsburg, Pa. "Keystone" & "Premium."
- Keystone Refining Co., Columbus, O. "Anti-Carbon."
- Keystone Supply Co., The, Columbus, Ohio. "Anti-Carbon."
- Loos & Dilworth, 134 S. Front St., Phila., Pa. "Paragon."
- Lynch, Alonzo K., Inc., 310-12 Flushing Ave., Brooklyn, N. Y. "Advance."
- McLean-Brandom Oil & Supply Co., 65 Long Wharf, Boston, Mass. ("M. & B." cylinder & "Knox All" axle.)
- Magie Bros., 9-11 N. Canal St., Chicago, Ill. "Rock" (cylinder, solidified palm & transmission.)
- Manhattan Oil Co., 51 Front St., New York, N. Y. "U-Neek."
- Marshall Oil Co., Marshalltown, Ia. "French" & "Moco."
- Miller, Frank Co., 349-51 W. 26th St., N. Y. City.
- Miller, Wm. P. Sons, Nott Ave. & Hancock St., L. I. City, N. Y. ("Excelsior" fibrous and "Pan-O-Lite" and "Excelsior" cylinder.)
- Miller & McLean, 120 Liberty St., N. Y. City. "M & M."
- ★Miller & Starr, 250 Greene St., Brooklyn, N. Y. "Commodore."
- Modoc Company, Fernwood, Pa. "Modoc."
- Monarch Mfg. Co., Council Bluffs, Ia.
- Mound City Oil & Supply Co., 202 N. Commercial St., St. Louis, Mo.
- National Oil & Supply Co., First & Essex Sts., Harrison, N. J. "Viscos."
- New York & New Jersey Lubricant Co., 165 Broadway, N. Y. City. "MoToRoL" cylinder; "Non-Fluid."
- New York Oil & Paint Co., 128 Maiden Lane, N. Y. City. "Bully."
- Nye, Wm. F., New Bedford, Mass. "Nyoil."
- Oakes, Fred T., 150 Nassau St., N. Y. City. "Oakes."



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Oil City Oil & Grease Co., Oil City, Pa. "Drake."  
 Panama Oil & Grease Co., 159 West 51st St., N. Y. City.  
 Paragon Refining Co., The, Front St., Toledo, Ohio.  
 Penn Petroleum Co., 117 N. 2nd St., Phila., Pa. "Primus."  
 Pennsylvania Lubricating Co., 34th St. & A. V. Ry., Pittsburg, Pa.  
 Pennsylvania Oil Works Co., 1771 Broadway, N. Y. City. "Fiat" & "Velox."  
 Petroleum Products Co., 3600 Grand River Ave., Pittsburg, Pa.  
 Pierce & Rice Oil Co., 554 Park Ave., Worcester, Mass.  
 Pigot, Sayre Co., The, 135 William St., N. Y. City. "Aurora."  
 Pittsburgh Gauge & Supply Co., 30th & Liberty Sts., Pittsburg, Pa. "Bestovall."  
 Reliance Oil & Grease Co., Cleveland, O.  
 Robinson, Wm. C. & Son Co., 336-342 North St., Baltimore, Md. "Autoline."  
 Royal Lubricating Oil Co., 116 Broad St., N. Y. City. "Min-Carb."  
 Schilling, Frederick, 365 Pearl St., N. Y. City.  
 Sheppard, W., 141 E. 25th St., N. Y. City. "Keoyama."  
 Sheppard, W. S., 22 Lawrence St., Newark, N. J. "Ideal."  
 Skat Mfg. Co., Hartford, Conn. (Cylinder.)  
 Smith, C. J. & Co., St. Paul, Minn. "Cisco."  
 Sonneborn, L. Sons, 262 Pearl St., N. Y. City. "Amalie."  
 Spence's, The Alden Sons Co., 369 Atlantic Ave., Boston, Mass.  
 Standard Oil Co., Inc., Room 609, 26 Broadway, N. Y. City. "Zerolene" & "Polarine."  
 Star Oil Co., 700-08 S. Desplaines St., Chicago, Ill.  
 Sullivan Oil Co., 413 Wells St., Chicago, Ill. "Sullivanoil" & "Sullivan's."  
 Swan & Finch Co., 151 Maiden Lane, N. Y. City. "Atlas."  
 Sweet, Chas. F., Inc., 20 Ford St., Hartford, Conn. "Mercedes."  
 Three-in-One Oil Co., Broadway, N. Y. City. "3-in-1."  
 Tiona Refining Co., Indianapolis, Ind. "Monarch."  
 Tropical Oil Co., W. 70th St. & L. S. & M. S. Ry., Cleveland, O.  
 Tygert, E. A. Co., 126 N. Front St., Phila., Pa. "Motorlube."  
 ★ Vacuum Oil Co., Rochester, N. Y. "Mobiloil."  
 Valvoline Oil Co., 11 Broadway, N. Y. City. "Valvoline."  
 ★ White & Bagley Co., The, Worcester, Mass. "Oilzum."  
 White Star Refining Co., 307 White Bldg., Buffalo, N. Y.  
 Whitney Chemical Co., 6122 Euclid Ave., Cleveland, Ohio. "Inter-Lube."  
 Winn, W. R., 143 Maiden Lane, N. Y. City. "Runeasy."  
 Wood, W. A. Co., 373 Atlantic Ave., Boston, Mass.  
 Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J. "Young's."  
 Young, Frank L. & Kimball, 111 Purchase St., Boston, Mass. "Youkim." (Cylinder.)  
 Zurn, O. F. Co., Broad & Lehigh Ave., Phila., Pa. "Zurnoil."

**OIL CUPS, Auto**

Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.  
 American Injector Co., Detroit, Mich.  
 American Lubricator Co., Detroit, Mich.  
 Bay State Stamping Co., 380 Chandler St., Worcester, Mass. "Handy."

★ Bowen Mfg. Co., Mechanic St., Auburn, N. Y. "Empress."  
 Buckeye Iron & Brass Works, 324 E. Third St., Dayton, Ohio.  
 Crane Co., 1214 S. Canal St., Chicago, Ill.  
 ★ Crosby Co., 171-189 Pratt St., Buffalo, N. Y.  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 ★ Doehler Die-Casting Co., 187 W. 9th St., Brooklyn, N. Y. "Doehler."  
 Edna Smelting & Refining Co., The, 525-31 Reading Rd., Cincinnati, O.  
 Erie Stamping & Mfg. Co., Erie, Pa. "Erie."  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Hall Mfg. Co., John & Gold Sts., N. Y. City.  
 Haydenville Co., Haydenville, Mass.  
 ★ Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Kelly & Jones Co., Greensburg, Pa.  
 Lavigne Mfg. Co., Commonwealth Ave. & R. R., Detroit, Mich. "Lavigne."  
 Lonergan, J. E. Co., 211-13 Race St., Phila., Pa.  
 ★ Lunkenheimer Co., The, Cincinnati, O. "Pioneer," "Victor," "Cardinal," "Sentinel," "Crown," "Reserve," "Royal," "Miami," "Champion" & "Nonpareil."  
 Merry, Edward, 395 Allen St., Springfield, Mass.  
 Michigan Lubricator Co., 661-71 Beaubien St., Detroit, Mich.  
 Powell, Wm. Co., 2521-2531 Spring Grove Ave., Cincinnati, O.  
 Sherman, H. B. Mfg. Co., 12 Barney St., Battle Creek, Mich. "Perfect" & "Guardian."  
 ★ Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y. "Buffalo."  
 Winkley Co., The, 226 Abbott St., Detroit, Mich. "Winkley."

**OIL CUPS, Cycle and Motorcycle**

★ Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill.  
 Bay State Stamping Co., 380 Chandler St., Worcester, Mass.  
 ★ Lunkenheimer Co., The, Cincinnati, Ohio.  
 Penberthy Injector Co., 360 Holden Ave., Detroit, Mich.  
 ★ Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y. "Buffalo."

**OIL GAUGES**

Auto Parts Co., 10 Weybosset St., Providence, R. I. "Apco." (For Fords.)  
 Edelmann, E. & Co., 36 La Salle St., Chicago, Ill.

**OIL-HOLE COVERS**

American Injector Co., Detroit, Mich.  
 Bay State Stamping Co., 380 Chandler St., Worcester, Mass. "Bennett."  
 ★ Bowen Mfg. Co., Mechanic St., Auburn, N. Y. "Empress."  
 Elliott Chemical Works, Newton, Mass.  
 Tucker, W. L. & C. F., 302 Asylum St., Hartford, Conn.  
 Winkley Co., The, 226 Abbott St., Detroit, Mich.

## OIL RINGS

(See Felt Washers.)

## OIL STORAGE OUTFITS

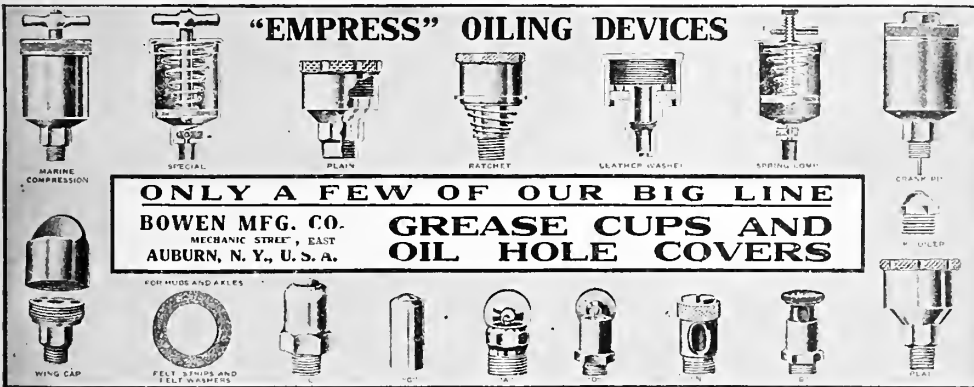
- American Oil Pump & Tank Co., The, Dayton, O. "American."  
 Auto Trading & Repair Co., 1515 Prospect Ave., Cleveland, O. "Kart-Tank."  
 ★Bowser, S. F. & Co., Inc., Ft. Wayne, Ind. "Bowser."  
 Delphos Mfg. Co., The, Delphos, O.  
 Eastern Oil Tank Co., 146 Fletcher St., Lowell, Mass. "Eastern." (Self-measuring.)  
 Geyser Oil Tank Co., Wayne & Clinton Sts., Fort Wayne, Ind. "Geyser."  
 Haines Oil Measuring Pump Co., Harrisburg, Pa. "Haines."  
 ★Hydraulic Oil Storage & Distributing Co., 606 Penobscot Bldg., Detroit, Mich. "Snell." (Hydraulic.)  
 Monarch Engineering & Mfg. Co., The, 1200-1206 American Bldg., Baltimore, Md. (For factories.)  
 National Oil Pump & Tank Co., 411-413 E. First St., Dayton, O.  
 Neil, William & Co., 615 Division St., Chicago, Ill.  
 New York Oil Cabinet Co., 221 Front St., N. Y. City. "Wiley."  
 Pressed Steel Tank Co., West Allis Station, Milwaukee, Wis. (Barrels.)  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.

- Tokheim Mfg. Co., The, Cedar Rapids, Iowa. (Pumps and tanks.)  
 Wallman Mfg. Co., 283-285 5th Ave., Milwaukee, Wis. (Oil tanks.)  
 Wayne Oil Tank & Pump Co., Ft. Wayne, Ind. "Wayne."  
 Western Oil Pump & Tank Co., 2437 Kosciuszko St., St. Louis, Mo.  
 Wilson, F. Cortez Co., 239-41 Lake St., Chicago, Ill. "W. & E. Cabinet," "W. & E. Cone," "Aztec" & "Number Nine."

## OILERS, Squirt

- Aluminum Goods Mfg. Co., Newark, N. J.  
 American Tube & Stamping Co., The, Bridgeport, Conn. "Swedoh." (Steel.)  
 Bloomer, R. E., Keithsburg, Ill. "Cannon." (Pump.)  
 Consolidated Fruit Jar Co., New Brunswick, N. J.  
 ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.  
 Hauck & Seebach Co., 291-95 Essex St., Brooklyn, N. Y.  
 Hero Mfg. Co., Gaul & Adams Sts., Phila., Pa.  
 Knapp Mfg. Co., N. Y. City.  
 Machine Accessories & Novelties Mfg. Co., 257 W. Exchange St., Providence, R. I.  
 Maple City Mfg. Co., Monmouth, Ill. "Maple City."  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."  
 Noera Mfg. Co., Waterbury, Conn. "Noera."  
 Vogel, Wm. Bros., 37 S. 9th St., Brooklyn, N. Y. (Emergency.)

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★ indicates Advertisers—see Index in back of book.



## OWNERS' AND DEALERS' LISTS

(See Lists.)

### PACKING

- Advance Packing & Supply Co., 55 S. Canal St., Chicago, Ill. "Tenax." (Flange.)
- ★Booth, N. E., 644 Pacific St., Brooklyn, N. Y. (Felt.)
- Bowers Rubber Co., San Francisco, Cal. (Rubber.)
- Canfield Mfg. Co., Lehigh Ave. & Howard St., Phila., Pa. ("Empire" gum core & "Amherst" fibrous metallic.)
- Carey, Philip Mfg. Co., Lockland, Ohio. (Asbestos & fibrous.)
- Cincinnati Rubber Mfg. Co., The, Cincinnati, Ohio. (Rubber.)
- Colgan Mfg. & Supply Co., 42 South St., N. Y. City. "Colgan's Alwaistite" & "Colgan's Reliable." (Sheet.)
- Combination Rubber Mfg. Co., Bloomfield, N. J.
- Continental Rubber Works, Erie, Pa. (Rubber.)
- Crandall Packing Co., Palmyra, N. Y. "Helios," "Regina," "Motorite," "Kymol" & "Lip."
- Crane Co., 1214 S. Canal St., Chicago, Ill. "Klingerit." (Steam.)
- Eagle Oil Supply Co., 104 Broad St., Boston, Mass. (Asbestos & fibrous.)
- ★Empire Tire Co., Trenton, N. J. (Asbestos.)
- Fitzgerald Mfg. Co., 208 N. Elm St., Torrington, Conn.
- Garlock Packing Co., Palmyra, N. Y. "Garlock." (Asbestos & rubber.)
- Gasket Supply Co., 1729 Ludlow St., Phila., Pa. "Right." (Rubber.)
- Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass. (Leather.)
- Greene, Tweed & Co., 109 Duane St., N. Y. City. "Palmetto."
- Hamilton Rubber Mfg. Co., Trenton, N. J. "Perfection Pink" & "Permanent Black." (Sheet.)
- Hart Packing Co., Boston, Mass. (Asbestos & fibrous.)
- Horton Boat Engine & Supply Co., 900 South Ave., Rochester, N. Y.
- Jenkins Bros., 71 John St., N. Y. City. "Jenkins."
- ★Johns-Manville, H. W. Co., 100 William St., N. Y. City. "Mobilene," "Mogul," "Vulcabeston" & "Permanite."
- Judd & Leland Mfg. Co., Clifton Springs, N. Y. (Air and water pumps.)
- Keasby & Mattison Co., Ambler, Pa. "Autobestos." (Asbestos & fibrous.)
- Mattison Rubber Co., Lodi, N. J. (Cylinder rubber.)
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. (Rubber.)
- National Metallic Packing Co., Oberlin, O. "National." (Metallic.)
- New Era Mfg. Co., The, Kalamazoo, Mich. "New Era." (Metallic.)
- New Jersey Asbestos Co., Camden, N. J. "Gladiator." (Asbestos.)
- Quaker City Rubber Co., 629 Market St., Phila., Pa. "Ebonite." (Rubber.)
- Republic Rubber Co., Youngstown, O.
- Sall Mountain Asbestos Mfg. Co., 7 North Canal St., Chicago, Ill. (Metallic sheet.)
- Schilling, Frederick, 365 Pearl St., N. Y. City.
- ★Thermoid Rubber Co., Trenton, N. J. "Vulcanoid," "Black Bare," "Special Black" & "Thermidor."

United & Globe Rubber Mfg. Co., Trenton, N. J. "Globe Black" & "Sunbeam."

U. S. Indestructible Gasket Co., 50 Church St., N. Y. City. "Ames." (Alloy high pressure sheets.)

Walworth Mfg. Co., 128 Federal St., Boston, Mass.

Watson, H. F. Co., Erie, Pa. (Asbestos.)

Winn, W. R., 143 Maiden Lane, N. Y. City.

Wolverine Leather Goods Co., 51-59 Fort St., E., Detroit, Mich.

### PADS, LICENSE

(See License Hangers.)

### PAILS, Folding

(See Collapsible Buckets.)

### PAINTING

(See Body Finishing.)

### PAINTS & COLORS

- Acme White Lead & Color Works, Detroit, Mich. "Ti-Ki."
- Adams & Elting Co., 159-163 Washington Blvd., Chicago, Ill. "Ad-el-ite." (Engine.)
- Allen, L. B. Co., Inc., 1353 Columbia Ave., Chicago, Ill. "Allen." (Lamp coloring & frosting.)
- American Lacquer Co., Bridgeport, Conn. (Boat bottom paint.)
- Arsenal Varnish Co., 25th St. & 4th Ave., Rock Island, Ill. "Arsenal."
- Balkwill Pattern Works, 1444 E. 49th St., Cleveland, O. (Hard wood fillers.)
- Billings-Chapin Co., Cleveland, Ohio. (Also "Sterling" aluminum bronze.)
- Binswanger, B. & Co., 115 N. Fourth St., Phila., Pa. (Aluminum enamel, gold enamel, aluminum & bronze powders, bronzing liquids.)
- Boston Varnish Co., Everett, Mass.
- Bridgeport Wood & Finishing Co., The, New Milford, Conn. ("Wheeler" wood filler & "Bridgeport" standard stains.)
- Bronze Powder Works Co., Elizabeth, N. J. "Ideal" & "Vulcan." (Aluminum & bronze paints.)
- Buffalo Enamel & Stain Co., Lord, Clinton & James Sts., Buffalo, N. Y. "True."
- Buffalo Oil, Paint & Varnish Co., Buffalo, N. Y.
- Carpenter-Morton Co., Boston, Mass. "Quality Brand." (Motor boat.)
- Cawn Mining & Mfg. Co., The, Canton, O. "Economy." (Roughstuff & primers.)
- Chavant, C. H. Co., 203 Cator Ave., Jersey City, N. J. "Vesuvine." (Aluminum.)
- ★Cincinnati Color Co., Eighth, Evans & Whately Sts., Cincinnati, Ohio. "Cincinnati." (Colors.)

**PAINTS & COLORS—Continued**

- Connecticut Oil Co., The, Waterbury, Conn. "Black Elastic."
- Cullen, F. C. & Co., 431 First National Bank, Chicago, Ill. (Aluminum & bronze.)
- Detroit Varnish Co., Detroit, Mich. "Red Seal." (Colors.)
- Devoe, F. W. & C. T., Reynolds Co., Fulton & William St., N. Y. City.
- Ditzler Color Co., 18-24 Baltimore Ave., W., Detroit, Mich. "D." (Colors, rough stuff, primers & fillers.)
- Essex Varnish Co., 92 Vesey St., Newark, N. J. (Colors.)
- Felton, Sibley & Co., 136-140 N. 4th St., Phila., Pa.
- Flood & Conklin Co., Newark, N. J. (Primers & surfacers.)
- Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O. "Forest City."
- French, Samuel H. & Co., Fourth & Callowhill Sts., Phila., Pa.
- Gerstendorfer Bros., 231 E. 42nd St., N. Y. City. (Aluminum & bronze.)
- Glidden Varnish Co., Cleveland, O. (Aluminum & copper bronze, auto & boat.)
- Good Paint Co., The, 1709-11 Austin Ave., Chicago, Ill. "Carbonall."
- Heath & Milligan Mfg. Co., 170-72 Randolph St., Chicago, Ill.
- Hoffman, J. W. Co., 8 Medford St., Boston Mass. "Hoffman's." (Boat.)
- Holland Enamel & Paint Co., 142 Fulton St., N. Y. City. "Hepco." (Imported.)
- Johnston Paint Co., 226 Main St., Cincinnati, O. (Also "Krakno" paint fillers & "Dull Paint" for motor boats.)
- Keene, Peaslee & Co., Amesbury, Mass. "Nelson."
- Keystone Paint & Filler Co., Muncy, Pa.
- Longhurst, Jas. S., Jr., Lynbrook, L. I., N. Y. "Peacock Blue" (for bluing metals.)
- Lowe Bros. Co., The, Dayton, Ohio. "High Standard."
- Lucas, John & Co., Phila., Pa. "Lucas" & "Metropolitan." (Colors.)
- Massachusetts Chemical Co., Walpole, Mass. (Weatherproof.)
- Masury, Jno. W. & Son, 44 Jay St., Brooklyn, N. Y.
- Morris Paint Co., 10017 Euclid Ave., Cleveland, Ohio. "Lastic." (Acid resisting for mufflers.)
- ★Murphy Varnish Co., Chestnut & McWhorter Sts., Newark, N. J.
- National Lead Co., 111 Broadway, N. Y. City. "Dutch Boy Painter." (White lead for painting.)
- ★New Jersey Paint Works, Wayne & Fremont Sts., Jersey City, N. J. "New Jersey." (Copper.)
- Nice, Eugene E., 272 S. Second St., Phila., Pa. "Nice."
- Pennsylvania Black Filler & Paint Co., Williamsport, Pa. "Pennsylvania." (Black iron filler & roughstuff.)
- Pierce, F. O. Co., N. Y. City.
- Pomeroy & Fischer, 28-30 Frankfort St., N. Y. City. (Imported.)
- Reno Bros. Paint Co., Pulaski, Pa. "Reno French Umber Filler."
- St. Louis Surfacers & Paint Co., St. Louis, Mo. Schmoeger, F. A., Sterling, Ill. "Sterling." (Iron enamel.)
- Schrack, C. & Co., 152-58 N. 4th St., Phila., Pa. (Auto & motor boat.)
- Smith, Edw. & Co., 129 West Ave., L. I. City, N. Y. (Colors.)

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### MY SPECIALTY

Dust Rings for the  
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Washers for all  
Lubricating and  
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Prompt Shipment of  
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Brooklyn, N. Y.

**PAINTS & COLORS—Continued**

- Sonneborn, L. Sons, 262 Pearl St., N. Y. City.  
"Amalie."  
Sub-Marine Paint Co., 133 Coyle St., Portland, Me. "Berry's Sub-Marine." (Boat.)  
★Valentine & Company, 257 Broadway, N. Y. City. Also 277 Dearborn St., Chicago, Ill. "Valentine." (Colors.)  
Wadsworth-Howland Co., 84 Wash Co., Boston, Mass. "W. H. & Co." (Colors.)  
Wiley, C. A. Co., Hunter's Point, N. Y. City. (And colors.)  
Woolsey, C. A. Paint & Color Co., Jersey City, N. J. (Motor boat.)

**PANELS, Body**

(See Body Parts.)

**PARTS TO ASSEMBLE  
COMPLETE AUTOMOBILE**

- Climax Electric Works, New Salem, Mass.  
"Climax."

**PATCHES**

(See Tire Repair Articles.)

**PATTERNS, Auto**

- Acme Steel & Malleable Iron Works, 245 Military Rd., Buffalo, N. Y. (Metal & wood.)  
Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O. (Metal.)  
Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.  
Balkwill Pattern Works, 1444 E. 49th St., Cleveland, O.  
Blair Tool & Machine Works, 24-27 West St., N. Y. City.  
Buffalo Gear & Pattern Works, 16-20 Elk St., Buffalo, N. Y.  
Colson, F. A. Pattern Works, 89-93 Main St., Buffalo, N. Y. (Wood & metal.)  
Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.  
Frontier Engineering Co., 816-36 Fort St., W., Detroit, Mich. (Wood & metal.)  
Hartford Pattern & Model Co., Inc., The, 120-124 Allyn St., Hartford, Conn. (And models, wood & metal.)  
Jurack, Chas., Pattern Works, 269 Clinton St., Milwaukee, Wis.  
Manufacturers' Foundry Co., The, Waterbury, Conn. (Motor.)  
Maxwell Engineering Co., 210 St. James St., Rome, N. Y. (Wood & metal.)  
Modern Pattern Works, 222 Webster St., Cincinnati, O. (Wood.)

- Mummert, Wolf & Dixon Co., Hanover, Pa. (And models.)  
National Jack & Mfg. Co., 132-34 S. Clinton St., Chicago, Ill. (Brass & metal.)  
Nobach, W. J. Pattern Works, 522-24 Jackson Blvd., Chicago, Ill.  
★Oberdorfer, M. L. Brass Co., 804-808 E. Water St., Syracuse, N. Y.  
Peeler, W. F., Goshen, Ind.  
Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O.  
Standard Pattern & Mfg. Co., The, Richmond, Ind.  
U. S. Aluminum Castings Co., Vandalia Ave., Cincinnati, O.  
West & Dodge, 384 Atlantic Ave., Boston, Mass.

**PATTERNS, Boat**

- Bay City Boat Mfg. Co., Bay City, Mich.  
Defoe Boat & Motor Works, Bay City, Mich.  
Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.  
Penn Mfg. Co., Chester, Pa.  
Pioneer Boat & Pattern Co., Wharf 7, Bay City, Mich.  
West & Dodge, 384 Atlantic Ave., Boston, Mass.

**PEDALS, Auto**

- Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O. (Bronze clutch & brake.)  
★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.  
Curry & Abeles, 229 Mulberry St., Newark, N. J. (Horn.)  
Downing, Chas. J., 1777 Broadway, N. Y. City. "Downing." (Foot.)  
F.-B. Company, The, Columbia, S. C. "F-B." (Automatic clutch release for Buick Model 10.)  
★General Mfg. Co., The, Elkhart, Ind.  
★Gray-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich. (Muffler cut out.)  
H. Brothers, The, 207 N. 43rd Court, Chicago, Ill. "HB."  
Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp." (Clutch & brake.)  
Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O. (Clutch & brake.)  
★McCue Co., Hartford, Conn. (Clutch & brake.)  
Medina Machine & Stamping Co., Medina, N. Y. (Cut out.)  
Metallic Specialties Co., 4228 Ludlow St., Phila., Pa. (Cut out.)  
Miller, Chas. E., 97-101 Reade St., N. Y. City. "Diamond M."  
Motor & Mfg. Works Co., The, Foot of Middle St., Geneva, N. Y. (Clutch & brake.)  
Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.  
Stryker, C. W., 314 E. Onondaga St., Syracuse, N. Y. "Stryker."  
★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City. (Clutch & brake.)  
Universal Wind Shield Co., 130-134 S. Clinton St., Chicago, Ill. "Universal." (Foot pedals for operating chime horns.)  
Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill.  
Western Electric Co., The, 465 West St., New York, N. Y.

★ indicates Advertisers—see Index in back of book.

## PEDALS, Cycle & Motor Cycle

Adams, Henry T. Co., 6823 S. Chicago Ave., Chicago, Ill. "Quick Action." (Motorcycle repair.)

Capitol Specialty Works, 147 Hudson Ave., Albany, N. Y. (Cycle, reserve.)

Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y. (Cycle.)

★Standard Co., The, Torrington, Conn. "B. C. I," "Star," "Bridgeport" & "Standard."

Harrington & King Perforating Co., 612-30 N. Union St., Chicago, Ill.

Manhattan Perforated Metal Co., 237 Center St., N. Y. City.

Mundt, Chas. & Sons, Inc., 53-57 Fairmount Ave., Jersey City, N. J.

Stimpson, Edwin B., 31 Spruce St., N. Y. City.

Throop Perforated Co., 80 Terrace, Buffalo, N. Y.

## PERFORATED METAL

Aitchison Perforating Co., 303 Dearborn St., Chicago, Ill.

## PET COCKS

(See Cocks.)

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# Cincinnati's Largest Manufacturer of Coach and Auto Colors

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COLORS AND VARNISHES

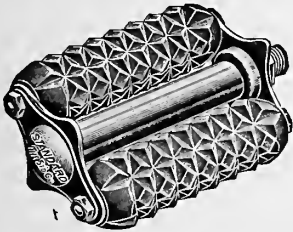
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Cincinnati, Ohio



**OUR SPECIALTIES:**  
Japan Colors, Elastic Colors, Oil Colors, Solid Covering, Color Rubbings, Varnish, Color Varnish, Varnish Stains, Fillers, Primers, Rough Stuff, Carriage Gloss Paints, Top Dressing, High Gloss Finish, Air Drying Enamels, Baking Enamels, Metal Fillers, Machine Paints, Shellacs.

# Standard Motorcycle Parts



Standard Motorcycle Pedals

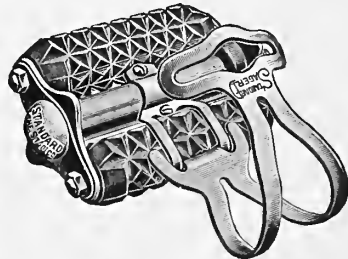
are just a little bit better than anything else of the kind on the market. That's why machines that are **STANDARD** equipped sell quicker than others.

**STANDARD PEDALS** wear well. They are strong and light, and the deep corrugations in the rubber hold the foot firmly and absorb vibration. They are reversible, thus enabling the rider to

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**STANDARD SAGER TOE CLIPS** are comfortable and highly efficient; strong and neat in appearance.

Write for details of our complete line, which includes **Spokes and Nipples, Bridgeport and Star Pedals** and the famous **BREECH-BLOCK Spark Plug**.



Standard Sager Motorcycle Toe Clips

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**PINIONS**

(See Gears &amp; Pinions.)

**PIPE COVERINGS**

- ★Johns-Manville, H. W. Co., 100 William St., N. Y. City. (Asbestos.)
- New Jersey Asbestos Co., Camden, N. J. "Gladiator."
- Walworth Mfg. Co., 128 Federal St., Boston, Mass.

**PIPE FITTINGS**

- Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass.
- Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco." (Flexible joints.)
- Bard Union Co., Norwich, Conn. "Bard." (Pipe unions & flange unions.)
- Barrett, James Mfg. Co., 48 Pearl St., N. Y. City. (Brass.)
- Crane Co., 1214 S. Canal St., Chicago, Ill. (Unions, nipples, brass fittings, etc.)
- Detroit Sanitary Supply Co., Detroit, Mich. (Brass.)
- Eastwood Wire Mfg. Co., Belleville, N. J. (Brass.)
- Elkhart Brass Mfg. Co., 908 Prospect St., Elkhart, Ind. (Brass.)
- Hamlin & Emery Brass Co., 26 Island St., Boston, Mass. (Brass.)
- ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. (Brass.)
- Illinois Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill. "Nokoros." (Unions & fittings.)
- ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.
- Kelly & Jones Co., Greensburg, Pa. (Brass.)
- Kinsey & Mahler Co., Peoria, Ill. (Brass.)
- ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa. (Couplings for copper pipe.)
- ★Lunkenheimer Co., The, Cincinnati, Ohio. (Unions, etc.)
- Malleable Iron Fittings Co., Branford, Conn. "M. I. F. Co." (Steam & gas.)
- Mechanical Devices Co., Inc., Watervliet, N. Y. "Indispensable." (Flexible pipe unions & elbows.)
- Morse Iron Works, Erie, Pa. (Malleable & cast iron.)
- Motorparts Co., St. Joseph, Mich. (Exhaust.)
- ★National Tube Co., Frick Bldg., Pittsburgh, Pa. "Kewanee." (Unions, ells & tees.)
- Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. (Compression tubing couplings.)
- New York Brass Foundry, 104 Centre St., N. Y. City.
- Nolte Brass Co., Springfield, O. (Brass unions.)
- No-Shammy Co., The, 5710 Hough Ave., N. E., Cleveland, O. "No-Shammy." (Unions & elbows.)
- ★Ohio Brass Co., Mansfield, O. (To order.)
- Oldberg Mfg. Co., Detroit, Mich.
- Sherman, H. B. Mfg. Co., 12 Barney St., Battle Creek, Mich. (Brass nipples, unions, etc.)
- Swing Union Co., 155 Water St., New London, Conn. "Swing."
- Thomas Brass & Iron Co., Waukegan, Ill. (Brass.)
- Turner Brass Works, The, Sycamore, Ill.
- Walworth Mfg. Co., 128 Federal St., Boston, Mass. (Brass.)

**PIPE JOINT COMPOUNDS**

- ★Dixon, Jos. Crucible Co., Jersey City, N. J. "Dixon's."
- ★Johns-Manville, H. W. Co., 100 William St., N. Y. City. "H. O."
- U. S. Graphite Co., Saginaw, Mich. "U. S. G. Co.'s."

**PIPING, Exhaust and Intake**

(See Manifolds.)

**PISTONS & PISTON RINGS**

- Capitol Foundry Co., The, Hartford, Conn.
- Columbia Steel & Shafting Co., Pittsburg, Pa.
- Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich. (Pins.)
- Empire Foundry Co., New Brunswick, N. J.
- Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.
- Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."
- Jorden, R. H., Millvale, Pa. (Steel.)
- Kilroy Piston Ring Co., The, 74 Cortlandt St., N. Y. City. "Kilroy." (Rings.)
- Manville Bros. Co., Waterbury, Conn.
- National Metallic Packing Co., Oberlin, Ohio. (Rings.)
- ★Spacke, F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind. (Also pins.)
- Wainwright, W. W. & Son, 16th St. & Western Ave., Connerville, Ind.
- Wille Piston Works, 17 Herkimer Pl., Brooklyn, N. Y. "Wille." (Also renewal pistons.)

**PISTON SEATING COMPOUNDS**

- Bornschein, J. F. & Co., 2351 Indiana Ave., Chicago, Ill. "Compression."

**PLANETARY GEARS**

(See Speed Change Gears.)

**PLATINUM RIVETS**

- American Platinum Works, 251 N. J. R. R. Ave., Newark, N. J. (Also platinum iridium.)
- Baker & Co., Newark, N. J. (Iridio platinum.)
- Boker, H. & Co., 101 Duane St., N. Y. City.
- Croselmire & Ackor Co., 42 Walnut St., Newark, N. J. (Platinum iridium.)
- Roessler & Hasslacher Chemical Co., The, 100 William St., N. Y. City. (Also platinum iridium.)

## POLISHERS

Continental Waste Co., 22 Clayton St., Dorchester, Mass. "XXX." (Polishing cloths.)  
 Howard Dustless Duster Co., 164 Federal St., Boston, Mass. "Howard." (Dustless duster.)  
 Mill Remnants Co., 102-04 Greenwich St., N. Y. City. (Polishing cloth.)  
 North, Jos. W. & Son, 6th, Fulton & Franklin Sts., Elizabeth, N. J. (Polishing cloths.)  
 Wood, W. A. Co., 373 Atlantic Ave., Boston, Mass. (Cleaning & polishing cloths.)

## POLISHES

(See Metal Polish & Wood Polish.)

## POLISHING, BUFFING & PLATING

Acorn Brass Co., 227 N. Peoria St., Chicago, Ill. (Polishing & plating.)  
 Aetna Brass Mfg. Co., The, 4800-4810 Hamilton Ave., Cleveland, O. (Buffing & polishing.)

Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich.  
 Boston Nickel Plating Co., Inc., 160 Portland St., Boston, Mass. (Plating.)  
 Bridgeport Electro Plating Co., 125 Kossuth St., Bridgeport, Conn. (Nickel, brass & copper plating.)  
 Champion Safety Lock Co., Geneva, Ohio. (Electro plating.)  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.  
 Clark Novelty Co., 380 Exchange St., Rochester, N. Y. (Nickel plating.)  
 Etching Co. of America, 2526-28 W. Congress St., Chicago, Ill. (Plating.)  
 Keeler Brass Co., Grand Rapids, Mich. (Brass plating.)  
 Keyless Lock Co., The, Indianapolis, Ind. (Nickel, brass & copper plating.)  
 Nehls Plating Works, 248 Brush St., Detroit, Mich. (Brass & nickel plating.)  
 Rockford Metal Specialty Co., Rockford, Ill. (Brass plating.)  
 Sterling Machine & Stamping Co., Wellington, O. (Electro plating.)  
 Tresal Bronzing & Plating Co., 245-47 W. 28th St., N. Y. City. (Brass & nickel plating.)  
 Turner Brass Works, The, Sycamore, Ill. (Plating & polishing.)  
 Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass. (Electro-plating.)

## PORCELAIN

(See Insulation.)

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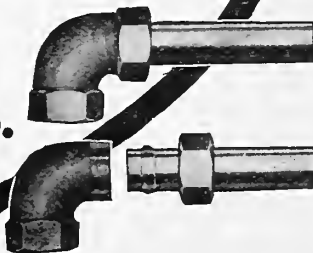
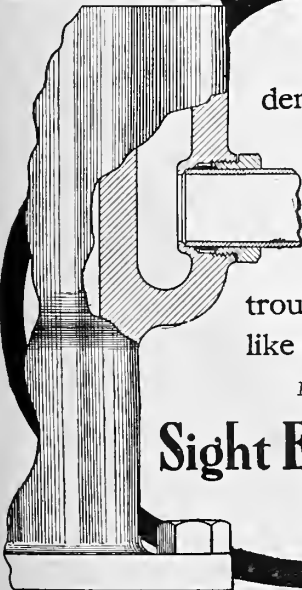
For water connection to automobile cylinder, without flanges or milled bosses. Just a counterbored and tapped hole and the neatest, tightest connection ever.

Certainly. Take it apart and put it up again. No gaskets and mighty little trouble. Our engineering department would like to talk with you about it.

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**Sight Feed Oil Pump Co.**

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**PORTABLE ELECTRIC LAMPS**

(See Inspection Lamps.)

**PORTABLE HOUSES**

(See Houses, Portable Auto &amp; Houses, Boat.)

**POTENTIAL CONTROL**

Leece-Neville Co., Cleveland, O. "Con-Arom-e-ter."

**PRESSED STEEL ARTICLES**

- Avery Stamping Co., The, Cleveland, O.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Driggs-Seabury Ordnance Corp., Sharon, Pa.  
 Erie Stamping & Mfg. Co., Erie, Pa.  
 ("Thompson" pressed steel clamps; "Esco" nut covers.)  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O.  
 Heggie-Woodruff Pressed Steel Co., Joliet, Ill.  
 ★Hydraulic Pressed Steel Co., Cleveland, O.  
 Indestructible Steel Wheel Co., 1221 Michigan Ave., Chicago, Ill.  
 Keim, John R. Mills, Inc., Kensington Ave., & Erie Tracks, Buffalo, N. Y.  
 Kinsey Mfg. Co., Toledo, Ohio. "Kinwood."  
 (Step mouldings.)  
 Parish & Bingham Co., 5363 Hamilton Ave., Cleveland, O.  
 Pressed Steel Tank Co., West Allis Station, Milwaukee, Wis.  
 ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.  
 Waterloo Drop Forge Co., Falls Ave. & Orr St., Waterloo, Ia.

**PRESSED STEEL FRAMES**

(See Frames.)

**PRESSURE GAUGES**

- American Steam Gauge & Valve Mfg. Co., 220 Camden St., Boston, Mass.  
 Artizan Brass Co., 204 Lincoln Park Blvd., Chicago, Ill. "ABC." (Compression testers.)  
 Ashcroft Mfg. Co., 85-89 Liberty St., N. Y. City. "Ashcroft." (Steam & air gauges.)  
 Ashton Valve Co., 271 Franklin St., Boston, Mass. "Ashton." (Steam, water & air.)

Brown Co., The, 1071-73 S. Clinton St., Syracuse, N. Y. "Brown Compressometer."  
 (Dash, tire pump, vulcanizing & whistling gauges.)

- Brunner Mfg. Co., Utica, N. Y.  
 Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.  
 Cleveland Steam Gauge Co., 1566 Merwin Ave., N. W., Cleveland, O.  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.  
 Du Vivier, Ernest H., N. Y. City. (Imported.)  
 Gleason-Peters Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y. "G.-P."  
 Industrial Instrument Co., The, Foxboro, Mass. "Standard" & "Lockwood." (Steam, air, oil & water.)  
 Lonergan, J. E. Co., 211-13 Race St., Phila., Pa.  
 ★Lunkenheimer Co., The, Cincinnati, O.  
 Marsh, Jas. P. & Co., 224 Washington St., Chicago, Ill. (Steam & air.)  
 Pittsburg Gage & Supply Co., 30th & Liberty Sts., Pittsburg, Pa.  
 Schaeffer & Budenberg Mfg. Co., 963-5 Kent Ave., Brooklyn, N. Y. "S. & B."  
 Stevens & Co., 375 Broadway, N. Y. City.  
 Uehling Instrument Co., Passaic, N. J. (CO<sub>2</sub> recorders.)  
 Westinghouse Air Brake, Co., Pittsburg, Pa. (Air.)  
 Zaubitz, August, 95-97 Cliff St., N. Y. City.

**PRESSURE REGULATORS**

- (For Tire Pressure Gauges, See under that Heading.)  
 Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.  
 Gilbert Mfg. Co., New Haven, Conn. "Bow-ers."  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 ★Lunkenheimer Co., Cincinnati, O. (Exhaust.)

**PRIMING DEVICES**

- ★American Die & Tool Co., Reading, Pa.  
 American Injector Co., Detroit, Mich. (Priming cups.)  
 American Lubricator Co., Detroit, Mich. (Priming cups.)  
 Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco." (Cups.)  
 Carter & Peek, 214 Carter Bldg., Jackson, Mich. "Lockwood." (Primers.)  
 Crone, F. G., 49 E. Utica St., Buffalo, N. Y. "Crone." (Pumps.)  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich.  
 Fries & Co., 91 Main St., Buffalo, N. Y. (Cups.)  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. "Hancock." (Cups.)  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill. (Cups.)  
 Lockwood Bros., 103-109 W. Pearl St., Jackson, Mich. (Dash.)  
 ★Lunkenheimer Co., The, Cincinnati, O. (Cups.)  
 Powell, Wm. Co., 2521-2531 Spring Grove Ave., Cincinnati, O. (Cups.)  
 Roberts Brass Mfg. Co., 1395-1407 Fort St., W., Detroit, Mich. (Cups.)

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**PROPELLERS**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
- Barber Bros., 101 Grape St., Syracuse, N. Y.
- Benton, Thos. P. & Son, La Crosse, Wis. "Benton." (Also reversing propellers.)
- Bintliff, W. T., Plainfield, N. J. "Alpha." (Manganese bronze.)
- Bleecker, Augustus & Sons, 44 South St., N. Y. City.
- Bryant & Berry Co., 32-36 Atwater St., West, Detroit, Mich. (Brass.)
- Camden Anchor-Rockland Machine Co., Camden, Me. "Knox."
- Champaign Bros., Ithaca, N. Y.
- Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y. "Columbian."
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- De Freest, Jerome E., 256 Third Ave., North, Troy, N. Y. "De Freest."
- Economic Engine Works, 3 Fulton St., Utica, N. Y.
- Enterprise Machine Co., 1114-22 S. 3rd St., Minneapolis, Minn. "Westman."
- Fenton, David, Manchester-by-the-sea, Mass. (To order.)
- Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.
- Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.
- Hickey Foundry Co., 345 Ellicott Sq., Buffalo, N. Y. (Aluminum, bronze & iron.)
- Holland Launch & Engine Co., The, Holland, Mich.
- Holliday Engineering Co., 749 Bunker St., Chicago, Ill.
- Jager, Chas. J. Co., 281-5 Franklin St., Boston, Mass.
- Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."
- ★McFarland Foundry & Machine Co., The, Inc., Trenton, N. J. "HARTHAN."
- Mark Motor Co., 8721 Harkness Rd., Cleveland, Ohio. "Mark."
- Mechanical Devices Co., Inc., Watervliet, N. Y. "Wishtail."
- Michigan Wheel Co., Canal & Legrande Sts., Grand Rapids, Mich. "Michigan." (Reversible & solid.)
- Noank Motor Co., The, Noank, Conn.
- Penn Mfg. Co., Chester, Pa.
- Perkins Wheel Co., Grand Rapids, Mich. "One Piece."
- Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa.
- Roper, C. F. & Co., Hopedale, Mass. "Roper Safety." (Reversing & solid.)
- Springfield Motor Co., The, Springfield, Mass.
- Stickler Weedless Wheel Co., Portage, Wis. "Stickler Weedless."
- Truscott Boat Mfg. Co., St. Joseph, Mich.
- Turner Brass Works, The, Sycamore, Ill.
- Waterman Marine Motor Co., 1506-12 Fort St., W., Detroit, Mich.

- Wilmarth & Morman Co., 583 Canal St., Grand Rapids, Mich. "Sintz."
- Wolverine Motor Works, Bridgeport, Conn. (Reversing.)
- Yacht Gas Engine & Launch Co., Phila., Pa.

**PROPELLER SHAFTS**

- Ansonia Brass & Copper Co., The, 99 John St., N. Y. City. (Tobin bronze.)
- Bintliff, W. T., Plainfield, N. J. "Alpha." (Manganese bronze.)
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.
- Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich.
- Electric Welding Products Co., The, Cleveland, O.
- ★Frost Gear & Machine Co., Jackson, Mich.
- Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich. (Reversing.)
- Hazard Engineering Co., Maple & Scherer Sts., & C. & P. R. R., Rochester, N. Y.
- Michigan Copper & Brass Co., Detroit, Mich. "Wolverine."
- ★National Tube Co., Frick Bldg., Pittsburg, Pa.

**PROPS, Car**

(See Jacks.)

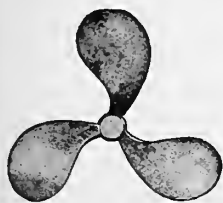
**PUBLICATIONS (Books, Maps, Etc.)**

- ★American School of Correspondence, 58th St. & Drexel Ave., Chicago, Ill. (Books on storage batteries, gas and oil engines and automobiles.)
- ★Audel, Theo. & Co., 63 5th Ave., N. Y. City. (Homan's "Self-Propelled Vehicles" and other mechanical hand books.)
- Bacon & Fynney, 120 Boylston St., Boston, Mass. "American Encyclopedia of the Automobile."
- Clason Map Co., Denver, Colo. (Road maps.)
- ★Dyke, A. L., 3947 Washington Ave., St. Louis, Mo. "Dyke's Troubles, Remedies & Repairs of the Automobile," & "Dyke's Motor Manual."

# THE HARTHAN PROPELLERS

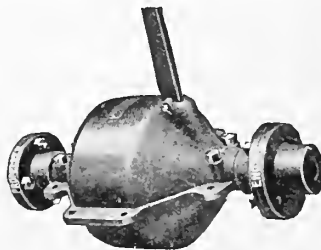
## and REVERSE CLUTCHES

**ARE UNSURPASSED  
FOR MARINE USE**



PATENTED

No "HARTHAN PROPELLERS" are genuine without our TRADE MARK stamped on the back of each blade. Look for it.



PATENTED

**McFARLAND FOUNDRY and MACHINE CO., Trenton, N. J.**

★ indicates Advertisers—see Index in back of book.

**PUBLICATIONS—Continued**

- Jones Live-Map Meter Co., 76th St. & Broadway, N. Y. City. "Jones Live-Map."  
 Keller & Risque Motor Co., The, 20 W. 3rd St., St. Paul, Minn. "Construction, Management & Care of Motorcycles."  
 Mendenhall, C. S., 512 Race St., Cincinnati, Ohio. "Mendenhall." (Maps & guides.)  
 ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill. "Photo-Auto-Map." (Chicago to New York.)  
 Thompson, C. C. & Co., 338 Wabash Ave., Chicago, Ill. (Automobile, motorcycle, aviation, electrical & motor boat.)  
 United States Addressing and Printing Co., 21-26 Murray St., N. Y. City. (Automobile Owners' Directory of State of N. Y.)  
 Walker Lithograph & Publishing Co., 400 Newbury St., Boston, Mass. "Walker." (Road maps, guides and atlases.)  
 ★Winship, W. W., 71 Summer St., Boston, Mass. (Trip record books.)

**PULLEYS, Motor Cycle**

- Hilaman, A. L. Co., Moorestown, N. J.  
 Merkel-Light Motor Co., The, Pottstown, Pa.  
 Mott Wheel Works, Pleasant St., Utica, N. Y. (Steel.)  
 Persons Mfg. Co., 54-68 Bloomingdale Rd., Worcester, Mass.  
 Prospect Motor Co., 1900 Broadway, N. Y. City. "Simplex."  
 Walton Motor Co., Inc., Broadway & Merrick Road, Lynbrook, L. I., N. Y. "Brown's." (Adjustable.)

**PUMPS, Bilge**

- American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City.  
 Bevin Bros. Mfg. Co., East Hampton, Conn.  
 Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich.  
 Curtiss Company, 20 Fulton St., N. Y. City.  
 Goblet-Dolan Co., 30 Old Slip, N. Y. City. "C-Yacht."  
 ★Goulds Mfg. Co., The, Seneca Falls, N. Y. "Goulds."  
 Kinney Mfg. Co., 100 Boylston St., Boston, Mass.  
 Lamont & Steers Engine Co., Stegmeyer's Boat Harbor, rear 1470 Jefferson Ave., E., Detroit, Mich.  
 Laughlin, Thomas Co., The, 143 Fore St., Portland, Me.  
 Loane-Hiltz Engineering Co., 306 S. Hanover St., Baltimore, Md.  
 ★Lobee Pump & Machinery Co., 140-52 Terrace St., Buffalo, N. Y. "Lobee."  
 New London Motor Co., New London, Conn. "Pequot."  
 Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City.  
 Stevens & Co., 375 Broadway, N. Y. City.  
 Turner Brass Works, The, Sycamore, Ill. "Turner."

**PUMPS, Circulation**

- American Lubricator Co., Detroit, Mich.  
 ★Anderson Motor Co., The, 16th & Jackson Sts., Anderson, Ind. "Anderson."  
 Auto & Power Appliance Co., The, 357-59 The Arcade, Cleveland, O.

- Blackmer Rotary Pump, Power & Mfg. Co., Petoskey, Mich. "Blackmer."  
 ★Brownell, F. A. Motor Co., 634-66 Lexington Ave., Rochester, N. Y.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Continental Engine Co., Chicago, Ill.  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich.  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 Kinney Mfg. Co., 100 Boylston St., Boston, Mass.  
 Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis. "Lipman."  
 ★Lobee Pump & Machinery Co., 140-52 Terrace St., Buffalo, N. Y. "Lobee."  
 Locke Regulator Co., Salem, Mass.  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McCord."  
 Maxwell & Fitch Co., The, Rome, N. Y.  
 Milwaukee Motor Co., 32nd & Burleigh Sts., Milwaukee, Wis.  
 Moline Pump Co., Moline, Ill. "Eli."  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 ★New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.  
 ★Oberdorfer, M. L. Brass Co., 804-808 East Water St., Syracuse, N. Y.  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Puritan Machine Co., 72-74 Brush St., E., Detroit, Mich. "Puritan."  
 Ross & Browne, 6127 Cottage Grove Ave., Chicago, Ill.  
 Stanhope Forge & Machine Works, 27 Stanhope St., Boston, Mass.  
 Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.

**PUMPS, Dashboard**

- American Lubricator Co., Detroit, Mich. (Gasoline.)  
 Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. (Air & oil.)  
 ★Lunkenheimer Co., The, Cincinnati, O. (Oil & fuel.)

**PUMPS, Hand Tire, Automobile**

- (See also Tire Inflators, Mechanical.)  
 American Machine Co., Eau Claire, Wis.  
 Auburn Auto Pump Co., Mason Lane, Auburn, N. Y.  
 Austin, H. K. & Co., Penacook, N. H.  
 ★Bridgeport Brass Co., Cor. Fairhill & Holland Aves., Bridgeport, Conn. "Demo," "Stapley," "Blizzard" & "Aeolus."  
 Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O.  
 Codman & Shurtleff, Inc., 120 Boylston St., Boston, Mass.  
 Columbia Grey Iron Co., Columbia, Pa. "Myers Aertite."  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Boss," "Reliable" & "Handy."  
 ★Diamond Rubber Co., Akron, O. "Diamond."  
 Fowler Brass Works, Inc., The, 2333-35 Wabash Ave., Chicago, Ill. "Cornell."  
 Franco-American Auto & Supply Co., 1404-1406 Michigan Ave., Chicago, Ill. "Bell."  
 Gleason-Peters Air Pump Co., 255-61 Classon Ave., Brooklyn, N. Y. "G.-P."  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. "Hancock."

**PUMPS, Hand Tire, Automobile—Continued**

Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-Man-Co."  
Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."  
★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. "Imperial Wixon."  
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Eureka Triplex," "Columbia" & "Hill."  
★Kellogg Mfg. Co., E. Main & Circle Sts., Rochester, N. Y. "Kellogg 5."  
Law, F. A. Machine Co., 41 Wells St., Hartford, Conn.  
★Lawrence, D. H. Co., Sterling, Ill. "Pitner."  
Merry, Edward, 395 Allen St., Springfield, Mass.  
Motor Car Equipment Co., 55 Warren St., N. Y. City. (English compound triple.)  
Noera Mfg. Co., Waterbury, Conn. "Noera."  
Optenburgh Iron Works, Sheboygan, Wis.  
Shawver Co., The, Springfield, O.  
Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill. "Skinner."  
Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."  
Standard Sheet Metal Co., Delaware Ave., Passaic, N. J.  
Stevens & Co., 375 Broadway, N. Y. City. "Esco."  
Turner Brass Works, The, Sycamore, Ill. "Turner."

**PUMPS, Cycle & Motorcycle, Tire**

Auburn Pump Co., 1 Mason Lane, Auburn, N. Y.  
Austin, H. K. & Co., Penacook, N. H. (Also

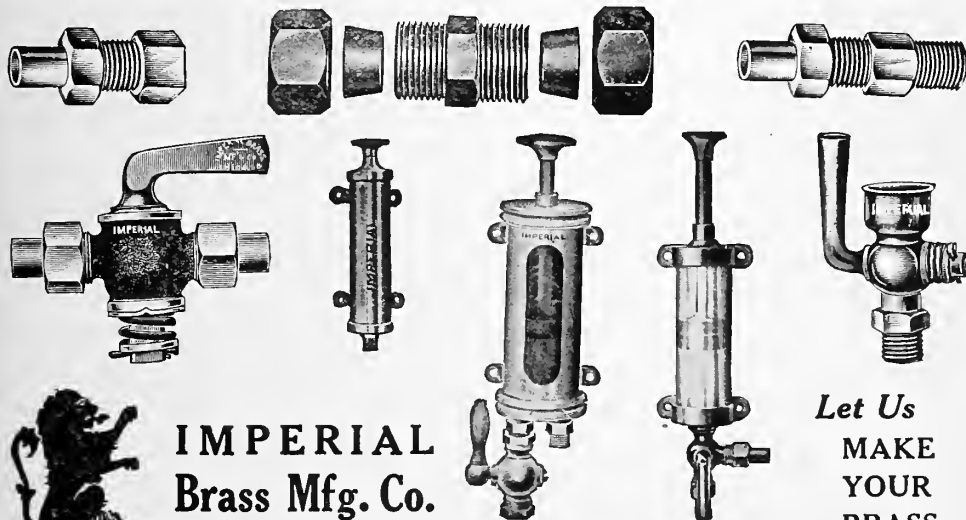
motorcycle.)

★Bridgeport Brass Co., Cor. Fairfield & Holland Aves., Bridgeport, Conn. "Bridgeport."  
Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. "G.-P."  
Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-Man-Co." (Motorcycle.)  
Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Cyclone" & "Tornado."  
Noera Mfg. Co., Waterbury, Conn. "Noera."  
Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.  
Standard Sheet Metal Co., Delaware Ave., Passaic, N. J.  
Stevens & Co., 375 Broadway, N. Y. City.

**PUMP CONNECTIONS, Tire**

Codman & Shurtleff, Inc., 120 Boylston St., Boston, Mass.  
★Goodrich, B. F. Co., Akron, O.  
★Lawrence, D. H. Co., Sterling, Ill. "Pitner."  
Motor Car Equipment Co., 55 Warren St., N. Y. City. "Grab."  
Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. (Nipples, auto.)  
Park City Brass Co., Springfield, Mass. "Star." (Auto.)  
★Rohrbacher Automatic Air Pump Co., 173 E. Water St., Portland, Ore. "Rohrbacher." (Auto.)  
Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. "Clair." (Auto.)  
Safety Tire Gauge Co., 1463 Michigan Ave., Chicago, Ill. "Safety." (Combination pump connection & air gauge.)

**LET US SUPPLY YOU** with Air Pumps, Water Pumps, Oil Pumps, Priming Cups, Gasoline Valves and Cocks, Pipe Fittings, Robe Rails, Handles, Regulators.



**IMPERIAL  
Brass Mfg. Co.**

441 S. Jefferson Street, Chicago

**Let Us  
MAKE  
YOUR  
BRASS  
WORK**

**PUMP CONNECTIONS, Tire—Continued**

- ★Schrader's, A. Sons, Inc., 28-32 Rose St., N. Y. City.  
 Smith Bros., 12 Essex St., Melrose, Mass. (Nipples, auto.)  
 Stevens & Co., 375 Broadway, N. Y. City.  
 "Rex," "Keno," "Bulldog," "Perfection" & "Boss" (Cycle), & "Keno," "Acorn" & "Perfection" (Auto).  
 Turner Brass Works, The, Sycamore, Ill. (Auto.)

**PUMPS, Power Tire**

(See Tire Inflators, Mechanical.)

**PUMPS, Steam Air**

- ★American Steam Pump Co., Battle Creek, Mich. "Marsh."  
 Locke Regulator Co., Salem, Mass.

**PUMPS, Steam Boiler Feed**

- ★American Steam Pump Co., Battle Creek, Mich. "Marsh."  
 Burr, E. M. & Co., Champaign, Ill.  
 Clark, Edward S., 242 Freeport St., Boston, Mass.  
 Locke Regulator Co., Salem, Mass.  
 Ofeldt, August & Son, 123 Liberty St., N. Y. City.  
 Ofeldt, F. W. & Son, Nyack, N. Y. (Hand.)

**PUMP GOVERNORS**

- Hall Mfg. Co., John & Gold Sts., N. Y. City.  
 "Atlas."

**PUNCTURE CLOSING COMPOUNDS**

(See Tire Repair Compounds.)

**QUADRANTS**

- ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 Zimmerman-Smith Co., The, North Tonawanda, N. Y. "Zimmerman."

**RACES, Ball**

(See Cups &amp; Cones.)

**RADIATORS**

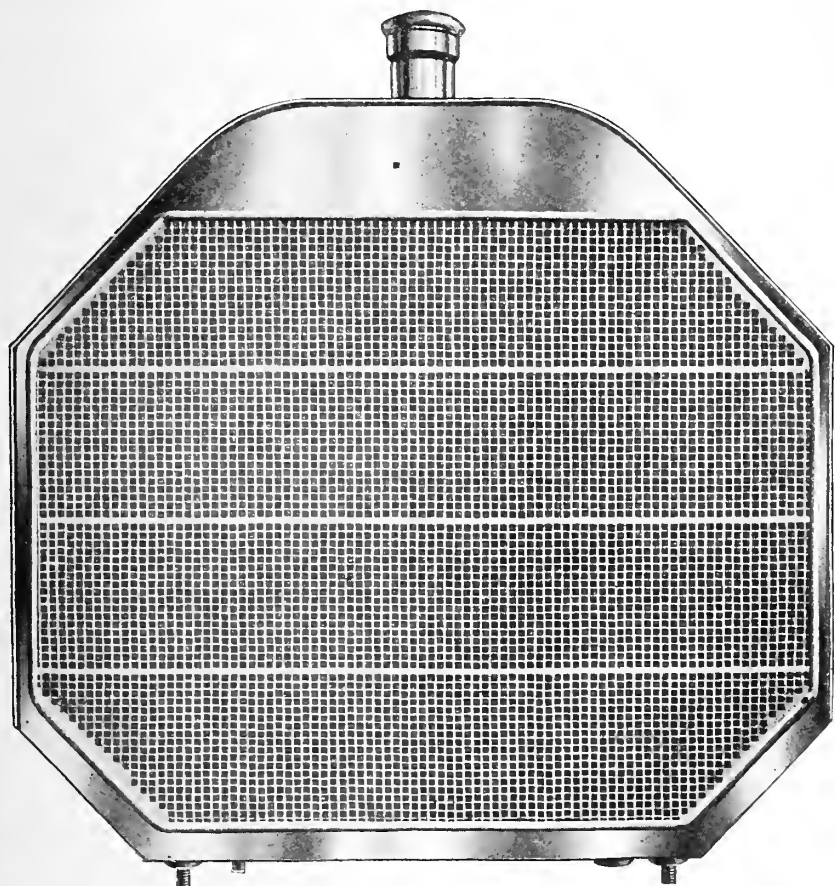
- A-Z Co., The, 527-29 W. 56th St., N. Y. City.  
 "A-Z."  
 Aepinus-Haggstrom Mfg. Co., 1502 Michigan Ave., Chicago, Ill.  
 Auto Sheet Metal Works, 2228 Michigan Ave., Chicago, Ill.  
 Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.  
 ★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 Bush Mfg. Co., 81 Commercial St., Hartford, Conn. "Bush."  
 Clayton's, Frank B. Sons, 1222-24 Race St., Phila., Pa.  
 Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O.  
 Comet Motor Works, 438 W. Madison St., Chicago, Ill.  
 Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich.  
 ★Detroit Radiator Co., 324 Jefferson Ave., W., Detroit, Mich. "Detroit."  
 Ducasse, Henry & Co., 735 7th Ave., N. Y. City. "G. & M.", (Imported.)  
 ★El Arco Radiator Co., 6 East 31st St., N. Y. City. "El Arco."  
 ★Fedders Mfg. Works, 57-59 Tonawanda St., Buffalo, N. Y. "Fedders."  
 Gem Mfg. Co., Chelsea Station, Boston, Mass.  
 Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn. "Haw-Man-Co."  
 Hudson Auto Lamp Works, 1646-48 Broadway, N. Y. City.  
 Kaiser, E., 42 Broadway, New York City. (Aluminum.)  
 Kells, W. J. Mfg. Co., 726-28 Eleventh Ave., N. Y. City. "Kells."  
 Kinsey Mfg. Co., Toledo, O. "Kinwood."  
 Livingston Radiator & Mfg. Co., Inc., 312 W. 52nd St., N. Y. City. "Livingston."  
 Lockport Stamping Co., Race St., Lockport, N. Y. "Lockport."  
 ★Long Mfg. Co., The, 1430-34 Michigan Ave., Chicago, Ill. "Long."  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McCord."  
 ★Mayo Radiator Co., The, State & Mill River Sts., New Haven, Conn. "Mayo."  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Symmetric."  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 Newark Rivet Works, 262 Lafayette St., Newark, N. J.  
 New Britain Sheet Metal Co., New Britain, Conn.  
 Noye Mfg. Co., Buffalo, N. Y.  
 Paragon Auto-Parts Co., The, 1709-1711 Broadway, N. Y. City.  
 Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City. "Reliable."  
 Reliance Auto Parts Mfg. Co., 244-50 W. 49th St., N. Y. City.  
 Rome-Turney Radiator Co., Rome, N. Y. (Vertical Tube.)  
 Sheet Metal Auto Parts Works, 201 W. 48th St., N. Y. City.  
 Steiner Mfg. Co., 144-46 Howard Ave., Newark, N. J.  
 Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
 Trageser, John Steam Copper Works, 447 W. 26th St., N. Y. City.

★ indicates Advertisers—see Index in back of book.

# Mayo Radiators

## ARE BEST

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The Quality of Mayo Radiators is fixed and their price based on that quality. Where Quality precedes price MAYO RADIATORS take precedence

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# MAYO RADIATOR CO.

NEW HAVEN, CONN.

### RADIATORS—Continued

Whitlock Coil Pipe Co., The, Hartford, Conn.  
"Whitlock."  
Wright Cooler & Hood Mfg. Co., 1545 Michigan  
Ave., Chicago, Ill. "Wright."

### RADIATOR CLEANING COM- POUNDS

(See Boiler & Radiator Compounds.)

### RADIATOR FILLER CAPS

★Imperial Brass Mfg. Co., The, 441 S. Jefferson  
St., Chicago, Ill.

### RADIATOR ORNAMENTS

Balzer, Gus, 1777-79 Broadway, N. Y. City.  
(Eagles & pennants.)  
Billiken Co., 290 Fifth Ave., Chicago, Ill.  
"Billiken."  
Colgan, The J. W. Co., 509 Sudbury Bldg.,  
Boston, Mass. "Colgan's."  
Downing, Chas. J., 1777 Broadway, N. Y. City.  
"Downing." (Eagles, elks' heads & dogs.)  
Ford Metal Specialty Co., 55 State St., Chi-  
cago, Ill. (Cut-out signs & colored plates.)  
Grammes, L. F. & Sons, Allentown, Pa.  
(Plates.)  
Greenduck Co., 200 S. Clinton Sq., Chicago,  
Ill. (Cut-out signs & hard enamel discs.)  
Grinaway Statuary Co., 15 & 17 West 18th St.,  
N. Y. City. "Honk" & "Grinaway."  
Murdock, The James, Jr., Co., 112 Opera  
Place, Cincinnati, O.  
Williams, C. L., 312 Halsey St., Newark, N. J.  
"Whirl-A-Gig."

### RADIATOR PARTS

American Hard Rubber Co., N. Y. City. (Hard  
rubber caps.)  
Briscoe Mfg. Co., 1427-57 Woodward Ave., De-  
troit, Mich. (Disks.)  
★Crosby Co., The, 171-189 Pratt St., Buffalo, N.  
Y. (Caps.)  
Königsloew, Otto Mfg. Co., Central Ave. & C.  
& P. R. R., Cleveland, O. (Disks & fins.)  
Luzerne Rubber Co., Trenton, N. J. (Hard  
rubber caps.)  
Rutter, Arthur T. & Co., 256 Broadway, N. Y.  
City. (Tubing.)  
Stokes, Jos. Rubber Co., Trenton, N. J.  
(Hard rubber caps.)  
United Wire & Supply Co., 109 Summer St.,  
Providence, R. I. (Tubing.)

### RADIATOR SHIELDS

Clayton's Sons, Frank B., 1222-24 Race St.,  
Phila., Pa.

### RADIUS RODS

Long Distance Telephone Mfg. Co., South  
Bend, Ind.

### RAILS, Robe

(See Robe Rails.)

### RATCHETS

Biddison Mfg. Co., The, 1516 Williamson St.,  
Madison, Wis. "Noisless."  
Philadelphia Gear Works, 1120-22 Vine St.,  
Phila., Pa.

### RATCHET PEDALS

(See Pedals.)

### RAW & SEMI-FINISHED MATE- RIAL

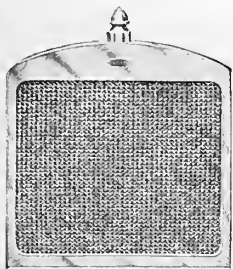
Akron Brass & Bronze Foundry Co., 10 W.  
Buchtel Ave., Akron, O. ("Cramp's"  
manganese bronze & "Parson's" white  
brass.)  
★American Bronze Co., Berwyn, Pa. "Non-  
gran." (Brake shoe bronze.)  
American Bronze Co., 1415 Niagara St., Buf-  
falo, N. Y. "A.B.C." (Manganese bronze  
ingots.)  
American Iron & Steel Mfg. Co., Lebanon, Pa.  
(Bar iron.)  
American Manganese Bronze Co., 99 John St.,  
N. Y. City. "Spare's" (manganese bronze,  
white bronze, plastic bronze & hydraulic  
bronze.)  
American Sheet & Tin Plate Co., Frick Bldg.,  
Pittsburg, Pa. (Sheet & tin mill prod-  
ucts & auto body stock.)  
American Steel & Wire Co., 115 Adams St.,  
Chicago, Ill. (Drawn steels, steel shaft-  
ing & screw stock.)  
★American Vanadium Co., Frick Bldg., Pitts-  
burg, Pa. "Carbonless" (Ferro-vanadium,  
cupro-vanadium & alumino-vanadium al-  
loys.)

★ indicates Advertisers—see Index in back of book.

**RAW AND SEMI-FINISHED MATERIAL—**  
**Continued**

- Andrew, J. H. & Co., 107 West St., N. Y. City.  
("Toledo" high-speed cutting steel & "Toledo Sheffield" crucible steel, imported.)
- Atlas Steel Co., Dunkirk, N. Y. (Crucible tool steel, "Loco" high speed steels & "Atlas" tempering steels.)
- ★Barnes, Wallace Co., The, Bristol, Conn. (Spring steel.)
- ★Becker Steel Co., 2226-27 Land Title Bldg., Phila., Pa. (Tool steels, chrome nickel, nickel & Tungsten alloy steels, tool steel tubing, vanadium & vanadium alloys & high speed steel, imported.)
- Bethlehem Steel Co., South Bethlehem, Pa. (Carbon, nickel, chrome nickel & special gear steel; tool steel; valve metals; vanadium steel; alloy steel bars.)

- Birkenstein, S. & Sons, 60-70 Ontario St., Chicago, Ill. (Ingot copper, tin, spelter, ingot brass, pig lead, aluminum, nickel, mercury, crucibles, bronze & manganese compositions, etc.)
- Boker, Herman & Co., 101 Duane St., N. Y. City. (Nickel steel for axles, transmission shafts & gears; nickel alloy for exhaust valves.)
- Brand, S. H. Co., Chicago, Ill. "Brand's." (Ferro-manganese.)
- Buffalo Copper & Brass Rolling Mill, Military Road, Buffalo, N. Y. (Sheet & rod brass & copper.)
- Cambria Steel Co., Arcade Bldg., Phila., Pa. (Steel.)
- Cammell, Laird & Co., Ltd., 25 Cliff St., N. Y. City. (High speed, crucible, chrome nickel, nickel manganese & tool steel.)

**LONG****DISTANCE****Insist Upon A Radiator EASILY REPAIRED**

WE MAKE THREE DISTINCT TYPES

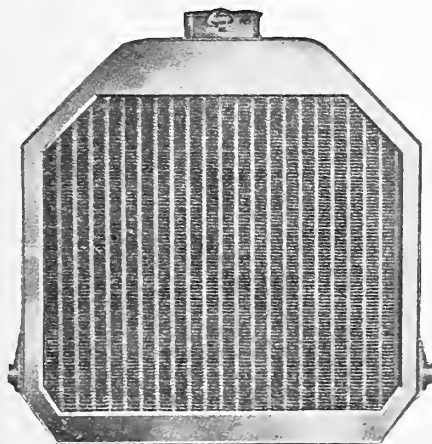
Long's { Flat Tube Honey Comb } Radiators  
 { Cellular }  
 { Spiral Tube }

**Always Efficient---Easily Repaired**

Broken tubes can be replaced with new ones at a small expense. Other makes of radiators, when damaged, must be replaced at a heavy expense.

**SEND FOR 1910 CATALOGUE**  
**LONG MANUFACTURING CO., CHICAGO**

**SPECIFY RADIATORS**  
**DETROIT**  
 "SOMETHING GOOD"

**USED BY 27 DIFFERENT MAKERS****E  
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D****Thermo-Syphon or Pump Circulation****SHEET METAL SPECIALTIES****DETROIT RADIATOR COMPANY****General Offices and Factory, Detroit, Michigan**

★ indicates Advertisers—see Index in back of book.



**RAW AND SEMI-FINISHED MATERIAL—Continued**

- Carnahan Tin Plate & Sheet Co., Canton, O. (Sheet steel for bodies, hoods, fenders, etc.)
- Carnegie Steel Co., Carnegie Bldg., Pittsburg, Pa. (Steel.)
- Carpenter Steel Co., Rooms 1908-10, 100 Broadway, N. Y. City. (Chrome nickel, nickel vanadium & cold rolled strip steel; "Zenith" high speed & regular tool steels.)
- Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Vanadium, manganese, chrome nickel & chrome nickel steel.)
- Coe Brass Mfg. Co., The, Torrington, Conn. (Brass, copper & bronze shells, plates, rolls, wire rods & tubes.)
- Colonial Steel Co., Pittsburg, Pa. ("Red Star" tool steel & "Colonial" high speed nickel steel & vanadium steel.)
- Columbia Smelting & Refining Works, 365 West St., N. Y. City. (Aluminum, ingot copper, ingot manganese bronze, spelter, pig tin & pig lead.)
- Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y. "Tobin." (Bronze shafting.)
- Columbia Steel Co., The, Elyria, O. (Steel for frames.)
- Columbia Steel & Shafting Co., Pittsburg, Pa. "Columbia." (Cold drawn & turned bar steel, cold drawn shafts, axle steel, special carbon steel, flat, square, hexagon & screw steel.)
- ★Compressed Steel Shafting Works, 393 Dorchester Ave., Boston, Mass. (Cold rolled bar steel.)
- ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa. (Bronze rods & sheets, rolled.)
- ★Crowley, John A. & Co., 120 Liberty St., N. Y. City. "Arrow." (Tool steel, chrome nickel steel, nickel & spring steel, imported.)
- Cumberland Steel Co., Williams St., & B. & O. R. R., Cumberland, Md. (Turned & ground & cold rolled steel shafting, flats, flange couplings & safety set collars.)
- Cyclops Steel Works, Titusville, Pa. (Tool steel, high speed steel, crucible steel & special alloy steels.)
- Damascus Bronze Co., Pittsburg, Pa. "Globe." (Phosphorized copper & tin & phosphor bronze ingot.)
- Damascus Crucible Steel Casting Co., New Brighton, Pa. "Capper's." (High speed & special tool steel.)
- Damascus Nickel Steel Co., Carnegie, Pa. "Damascus." (Tool steel, nickel steel, cone steel.)
- Dee, Thos. J., 67-69 Washington St., Chicago, Ill. (Platinum.)
- Disston, Henry & Sons, Inc., Tacony, Phila., Pa. (Nichol, chrome, high speed & tool steels.)
- Elliott, H. A., 7502 Carnegie Ave., Cleveland, Ohio. (Chrome nickel steel.)
- Elliott-Blair Steel Co., Taylor & Mercer Sts., Newcastle, Pa. (Cold rolled strip steel.)
- Farist Steel Co., 137 E. Main St., Bridgeport, Conn. (Tool steel.)
- Follansbee Bros. Co., Third & Liberty Ave., Pittsburg, Pa. (Sheet steel.)
- Frasse, Peter & Co., 130-32 Worth St., N. Y. City. ("F. A. G." German steel balls & ball bearings, "Poldi" chrome nickel steel, high speed steel, alloy steels, carbon steels, auto springs & spring steels & tool steel tubing, imported.)
- Funk Engineering Co., 39-47 Fourteenth St., Hoboken, N. J. (Nickel chrome steel.)
- Globe Metal Co., 401 W. Ontario St., Chicago, Ill. "Globe." (Manganese bronze, brass & bronze compositions.)
- Goldschmidt Thermit Co., 90 West St., New York City. "Thermit." (Metals & alloy.)
- Halcomb Steel Co., Syracuse, N. Y. (Chrome nickel, nickel, chrome-vanadium steels; "Halcomb" high speed, self-hardening, double-special & "Ketos" oil hardening steels; polished & unpolished drill rods.)
- Hampden Machine Screw Co., Springfield, Mass. (Die cast metal.)
- Harrow Spring Co., 745 E. Vine St., Kalamazoo, Mich. (Steel.)
- Heller Bros. Co., 865 Mt. Prospect Ave., Newark, N. J. "Heller's." (Steels.)
- Holliday, W. J. & Co., Indianapolis, Ind. (Cold rolled steel, forging steel, tool steel & steel sheets.)
- Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Sheet brass & copper, brass-spelter.)
- Indestructibilite Metal Co., 50 Church St., N. Y. City. "Indestructibilite." (Metal sheets, wire, castings, rods & special shapes.)
- Inland Steel Co., 1st National Bank Bldg., Chicago, Ill. (Steel.)
- International Engineering Co. of N. J., 1779 Broadway, N. Y. City. Mango silicon steel, imported.)
- ★Johns-Manville, H. W. Co., 100 William St., N. Y. City. (Asbestos wood.)
- Jones, B. M. & Co., 141 Mills St., Boston, Mass. ("Musher" steels & "Taylor Best Yorkshire" iron, imported.)
- Jones & Laughlin Steel Co., Pittsburg, Pa. (Steel.)
- Keasby & Mattison Co., Ambler, Pa. (Sheet asbestos.)
- Kent, Edwin R. & Co., 115 Adams St., Chicago, Ill. ("Kent's" tool steel, imported.)
- Kidd Bros. & Burgher Steel Wire Co., Alliquippa, Pa. ("Blue Label," "Kidd Special White Label" & unpolished drill rod, "Kidd Bros. & Burgher" nickel steel for axles, cold drawn cam shaft & special shapes, steel spring wire.)
- Krefeld Steel Co., 50 Church St., N. Y. City. (Tool steel.)
- Krupp (Thomas Prosser & Son), P. O. Box 878, G. P. O., N. Y. City. (Steel.)
- Leavitt, C. W. & Co., Cortlandt Bldg., 30 Church St., N. Y. City. ("Leavitt" magnesium metal & "Girod" electric steel.)
- Lockport Iron & Steel Co., Pittsburg, Pa. "Vulcan," "Vulcan Special," "Vulcan XX" & "Hexagon" (iron) & "Hexagon" (steel.)
- Ludlum Steel & Spring Co., Watervliet, N. Y. (Tool steel.)
- Lumen Bearing Co., Buffalo, N. Y. "L. B." (Manganese bronze.)
- McKenna Bros. Brass Co., First Ave. & Ross St., Pittsburg, Pa. (Brass & copper sheet, rod, pipe & tubing.)
- Machol, Morris R., 32 Park Place, N. Y. City. "Mangalium." (Aluminum alloy, imported.)
- ★Merchant & Evans Co., 517 Arch St., Phila., Pa. "Star." (Brass & copper wire & sheets; imported steels.)
- Michigan Copper & Brass Co., Detroit, Mich. "Wolverine." (Sheet brass & copper; brass rods.)
- ★Milton Mfg. Co., Milton, Pa. (Bar iron.)
- Nash, Geo. Co., 217 Pearl St., N. Y. City. "Ultra Capital." (High speed cutting steels, tempered spring steels, cold & rolled tool steel, imported.)
- New Era Mfg. Co., The, Kalamazoo, Mich. ("Metallic Phosphor," phosphor tin & "New Era" aluminized zinc.)
- New Haven Copper Co., Seymour, Conn. (Sheet copper.)
- New Jersey Asbestos Co., Camden, N. J. "Gladiator." (Sheet asbestos.)

**RAW AND SEMI-FINISHED MATERIAL—  
Continued**

- New Process Steel Co., Lancaster, Pa. ("New Process." (Drill rod, steel wire, annealed tool steel, roller ball steel, steel shafts, drawn nickel steel & drawn steel shapes.)
- New York Asbestos Mfg. Co., 80 John St., N. Y. City. (Sheet asbestos.)
- Ney, The J. M. Co., Hartford, Conn. (Platinum & platinum & iridium wire.)
- Ohio Seamless Tube Co., The, Shelby, Ohio. "Ohio Special." (Seamless steel.)
- Orford Copper Co., The, 43 Exchange Place, N. Y. City. "Monel Metal." (Bars, rods, wire & ingots.)
- Osborn, The J. M. & L. A. Co., Cleveland, O. (Copper, charcoal iron, lead coated, Monel metal & Toncan metal sheets, special battery box, fender panel & tool box stock & charcoal tinned sheets for gasoline tanks.)
- ★Paddock Cork Co., 1209-1217 De Kalb Ave., Brooklyn, N. Y. (Granulated cork for transmissions.)
- Park Drop Forge Co., The, 730 E. 79th St., Cleveland, O. (Alloy, chrome, nickel & vanadium steel.)
- Philadelphia Steel & Forge Co., 50 Church St., N. Y. City. ("PF Standard" alloy steels & "PF Special" rolled bars of carbon steel.)
- Phillips, F. R. & Sons Co., Penn Bldg., Phila., Pa. (Tool steel, imported.)
- Phosphor Bronze Smelting Co., The, Ltd., 2200 Washington Ave., Phila., Pa. "Elephant Brand Phosphor Bronze." (Ingots, wire, rods, sheets, etc.)
- Pittsburgh Steel Specialties Co., Pittsburgh, Pa. "Aluma Sheet." (Aluminum coated steel.)
- Pittsburgh Tool Steel Wire Co., Monaca, Pa. "Monaca" & "Champion." (Tool steel & drill rods.)
- Platt, Charles S. Co., 29 Gold St., N. Y. City. (Platinum, silver sheet, silver wire & gold plated metal.)
- Randolph-Clowes Co., The, Waterbury, Conn. (Sheet brass & brass rods.)
- Reeves, Paul S. & Son, 1415 Catharine St., Phila., Pa. (Phosphor bronze in ingots, "Reeves Diamond" rods, sheets, etc., "Tubal" manganese bronze, "Reeves" white brass & "Reeves Diamond" phosphor copper.)
- Riverside Steel Casting Co., 451-473 Riverside Ave., Newark, N. J. (Steel & Monel metal.)
- Rome Brass & Copper Co., Rome, N. Y. "Rome Quality." (Brass & copper sheets, wire & rods.)
- Rutter, Arthur T. & Co., 256 Broadway, N. Y. City. (Brass, copper & German silver sheets, rods, tubing & wire.)
- Schoonmaker, A. O., 221 Fulton St., N. Y. City. (Cut & block mica.)
- Seymour Mfg. Co., The, Seymour, Conn. (German silver, brass, bronze, phosphor bronze & copper sheets, wire rods, tubes & blanks.)
- ★Sier-Bath Co., 143 W. 54th St., N. Y. City. ("Eischioof's" German chrome nickel steel & "Elephant" phosphor bronze rods.)
- Standard Gauge Steel Co., Beaver Falls, N. Y. (Finished.)
- Stanley Works, Lake St., New Britain, Conn. (Cold rolled strip steel.)
- Stillman-White Foundry, Bark St., Providence, R. I. (Phosphor bronze.)
- Superior Steel Co., Carnegie, Pa. (Hot & cold rolled strip steel.)
- Sweet's Steel Co., Williamsport, Pa. (Bar steel.)
- Syracuse Smelting Works, New York, N. Y. (Ingot aluminum.)
- Taunton-New Bedford Copper Co., New Bedford, Mass. (Brass, bronze & copper sheets, bars, rods, etc.)

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**RAW AND SEMI-FINISHED MATERIAL—Continued**

- Taylor, N. & G. Co., 308 Chestnut St., Phila., Pa. (Sheet steel, tinplate, filling metal for auto bodies, small billets, etc.)
- Trenton Iron Co., Trenton, N. J. "T. I. C. O." (Roller bearing steel.)
- Union Drawn Steel Co., Beaver Falls, Pa. (Steel-Bessemer, open hearth & crucible.)
- United States Aluminum Co., The, Pittsburg, Pa. (Aluminum.)
- ★U. S. McAdamite Metal Co., 18-28 Rapelye St., Brooklyn, N. Y. "McAdamite." (Metal.)
- U. S. Reduction Co., Chicago, Ill. (Pattern metals.)
- United Steel Co., The, Canton, O. (Vanadium steel.)
- Vanadium Alloys Co., 25 Broad St., N. Y. City (Vanadium.)
- Vanadium Metals Co., Frick Bldg., Pittsburg, Pa. "Victor Vanadium." (Bronze rods, sheets & wire, non-corrosive silver metal.)
- Victor Metals Co., E. Braintree, Mass. "Victor." (Vanadium bronze & alloy.)
- Vulcan Crucible Steel Co., Aliquippa, Pa. (Tool vanadium & chrome steel.)
- ★Ward, Edgar T. & Sons, 23-25 Purchase St., Boston, Mass. (Cold rolled & tool steels.)
- Watson, H. F. Co., Erie, Pa. (Sheet asbestos & asbestos tubing.)
- West Leechburg Steel Co., Pittsburg, Pa. (Cold & hot rolled strip steel.)
- Youngstown Sheet & Tube Co., Youngstown, O. (Iron & steel pipe billets, sheet bars, iron & steel sheets, galvanized sheets, rods, etc.)

**REAR SIGNALS**

- ★Mosler, A. R. & Co., 163 W. 29th St., New York City. "Isti."

**RECORDERS, Vehicle**

- Automobile Protection Co., The, 322 Hudson St., N. Y. City. "Watch-Dog."
- Jones Speedometer, The, Broadway & 76th St., New York, N. Y. (Recording speed and distance meter.)

**REFLECTORS, Lamp**

(See Mirrors & Reflectors.)

**RELIEF COCKS**

(See Cocks.)

**REMOVABLE RIMS**

(See Rims, Removable.)

**REVERSE GEARS**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
- American Oil Engine Co., 1779 Broadway, N. Y. City. "American."
- Benton, Thos. P. & Son, La Crosse, Wis.
- ★Brownell, F. A. Motor Co., 634-66 Lexington Ave., Rochester, N. Y.
- Champaign Bros., Ithaca, N. Y.
- Continental Motor Mfg. Co., Muskegon, Mich.
- Enterprise Machine Co., 1114-22 S. 3rd St., Minneapolis, Minn. "Westman."
- Evans Stamping & Plating Co., Cushman St., Taunton, Mass. "Paragon."
- Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.
- Ganschow, Wm. Co., Washington Blvd. & Morgan St., Chicago, Ill.
- Gies Gear Co., 45 E. Fort St., Detroit, Mich. "Gies."
- Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich. (Reverse friction clutches.)
- ★Hazard Engineering Co., Maple & Scherer Sts. & C. & P. R. R., Rochester, N. Y.
- Holliday Engineering Co., 749 Bunker St., Chicago, Ill. "Holliday."
- Jencick Motor Mfg. Co., Port Chester, N. Y.
- Johnson, The Carlyle, Machine Co., P. O. Box D, Manchester, Conn. "Johnson."
- Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."
- ★McFarland Foundry & Machine Co., The, Inc., Trenton, N. J. "Harthan."
- Mark Motor Co., 8721 Harkness Road, Cleveland, O. "Mark."
- Meisel Press & Mfg. Co., 944 Dorchester Ave., Boston, Mass.
- Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich.
- Michigan Wheel Co., Canal & Legrande Sts., Grand Rapids, Mich.
- Miller Bros., 2331 N. Talman Ave., Chicago, Ill.
- ★Model Gas Engine Works, Peru, Ind.
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- ★New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.
- Snow & Petrelli Mfg. Co., 441-45 Chapel St., New Haven, Conn. "Joe's."
- Sparks, C. F. Machine Co., Alton, Ill.

**RIMS, Automobile**

(See also Rims, Removable.)

- American Tube & Stamping Co., The, Bridgeport, Conn. "Swedoh" (spring steel.)
- Baltimore Hub-Wheel & Mfg. Co., 326-32 N. Holliday St., Baltimore, Md.
- Breece Mfg. Co., Portsmouth, O.
- Crane & MacMahon, 8-10 Bridge St., N. Y. City. "Star" & "Hickory Nut."
- Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn. (Wooden.)
- Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
- Empire Bending Works, Lancaster, Pa.
- ★Firestone Tire & Rubber Co., Akron, O.
- ★G & J Tire Co., Indianapolis, Ind. "G & J."
- ★Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear."
- Hagerstown Spoke & Bending Co., Hagerstown, Md. (Wood.)
- K. H. Wheel Co., 1208-50 Military Ave., Detroit, Mich.
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich.
- Mott Wheel Works, Pleasant St., Utica, N. Y.
- Newmastic Tire Co., 151 W. 68th St., N. Y. City. "Parker."
- Republic Rubber Co., Youngstown, O.

**RIMS, Automobile—Continued**

- Standard Universal Rim Co., The, Dublin Ave. & Hocking St., Columbus, O. (Steel.)
- ★Standard Welding Co., The, 76th St., N. W. & L. S. & M. S. R. R., Cleveland, Ohio. (Clincher & detachable.)
- Toledo Carriage Wood Work Co., The, Toledo, Ohio. "Toledo C. W.-W. Co."
- United States Wheel & Rim Co., Ltd., St. Anne, Ill.
- Weston-Mott Co., Flint, Mich. "Weston-Mott." (Steel.)
- Winchester Lumber Co., Winchester, Ohio.

**RIMS, Removable or Demountable**

- Alpha Rim Co., The, Room 910, Marbridge Bldg., N. Y. City. "Alpha."
- Booth Demountable Rim Co., 8410 Lake Ave., Cleveland, O. "Booth."
- Burroughs Demountable Rim Co., The, 225 W. 57th St., N. Y. City. "Dorain."
- Bushey, E. J., 1777 Broadway, N. Y. City. "Bushey."
- Byam, Eber C., 45 Lake St., Chicago, Ill. "Byam."
- Continental Caoutchouc Co., 1788-90 Broadway, N. Y. City. "Continental."
- Denegre Demountable Rim Co., 522 S. 20th St., Birmingham, Ala. "Denegre."
- ★Diamond Rubber Co., Akron, O. "Diamond."
- Dow Rim Co., 1783 Broadway, N. Y. City. "Dow."
- ★Empire Tire Co., Trenton, N. J. "Empire."
- ★Firestone Tire & Rubber Co., Akron, Ohio. "Firestone."
- ★Fisk Rubber Co., The, Chicopee Falls, Mass. "Fisk."
- Ford Demountable Rim Co., Bridgeport, Conn. "Ford." (For Fisk wheels.)

- Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill. "Fowler."
- ★Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear Doolittle."
- Hartford-Vinet Co., The, 150 Bay St., Jersey City, N. J. "Hartford-Vinet."
- Healy Leather Tire Co., Healy Bldg., New York City. "Healy."
- Howard Demountable Rim Co., Broad St., Trenton, N. J.
- Jordan, R. W., 28 Belvidere St., Boston, Mass. "Jordan."
- Michelin Tire Co., Milltown, N. J. "Michelin."
- Midgley, Thomas, Columbus, O.
- Nadall-Van Sicklen Mfg. Co., 1339 Michigan Ave., Chicago, Ill. "Nadall."
- O'Gorman, Younie Co., Inc., Portland, Ore.
- ★Sager, J. H. Co., 265 South Ave., Rochester, N. Y. "Sager."
- Security Demountable Rim Co., 215-217 E. 21st St., Chicago, Ill. "Security."
- ★Swinehart Tire & Rubber Co., The, Akron, O. (Truck.)
- Universal Rim Co., 1301 Michigan Ave., Chicago, Ill. "Universal."

**RIMS, Cycle & Motorcycle**

- American Tube & Stamping Co., The, Bridgeport, Conn. (Cycle.)
- ★G & J Tire Co., Indianapolis, Ind. "G & J."
- Mott Wheel Works, Pleasant St., Utica, N. Y.
- Standard Universal Rim Co., The, Dublin Ave. & Hocking St., Columbus, O. (Motorcycle, steel.)
- ★Standard Welding Co., The, 76th St., N. W. & L. S. & M. S. R. R., Cleveland, O.
- Tucker Wood Work Co., Sidney, O. "Tucker."
- United States Wheel & Rim Co., St. Anne, Ill.

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**RIVETS**

- American Iron & Steel Mfg. Co., Lebanon, Pa.  
 American Screw Co., Providence, R. I. (Iron & steel.)  
 Atlas Bolt & Screw Co., 1289 Marquette Road, N. E., Cleveland, O. "Atlas."  
 Bay State Screw Co., Hatfield, Mass.  
 Blake & Johnson Co., Thomaston Ave., Waterbury, Conn. (Brass & copper.)  
 Border Bolt & Nut Lock Co., Richmond, Ind.  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 ★Bridgeport Brass Co., Cor. Fairfield & Holland Aves., Bridgeport, Conn. "Crown." (Copper.)  
 Champion Rivet Co., Rice Ave. & Erie R. R., Cleveland, O. "Victor."  
 Clark Bros. Bolt Co., Milldale, Conn.  
 Cobb & Drew, Inc., Plymouth, Mass.  
 Columbia Screw Co., 106th St. & Corliss Ave., Chicago, Ill.  
 Crescent Belt Fastener Co., 143 E. 23rd St., N. Y. City. "Crescent."  
 Falls Rivet & Machine Co., Cuyahoga Falls, Ohio. (Brass & copper.)  
 Gem Mfg. Co., Chelsea Station, Boston, Mass.  
 Grammes, L. F. & Sons, Allentown, Pa. (Brass & German silver.)  
 Grand Crossing Tack Co., Grand Rapids, Mich. (Soft steel.)  
 ★Hassall, John, Inc., 183 Lafayette St., N. Y. City.  
 Hoopes & Townsend Co., 1330 Buttonwood St., Phila., Pa.  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Brass & copper.)  
 Keeler Brass Co., Grand Rapids, Mich. (Brass, copper & iron.)  
 Kirk-Latty Mfg. Co., W. Madison Ave. & W. 84th St., Cleveland, O.  
 Lamsan & Sessions Co., 2188 Scranton Road, Cleveland, O. (Iron & steel.)  
 Michigan Bolt & Nut Works, foot of Meldrum Ave., Detroit, Mich.  
 Pittsburg Rivet Co., 38th St. & Junction Ry., Pittsburg, Pa. (Steel.)  
 Plymouth Mills, Plymouth, Mass. (Iron & steel.)  
 Progressive Mfg. Co., Torrington, Conn. (Brass, steel, copper & German silver.)  
 Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass. (Iron & steel.)  
 Rome Brass & Copper Co., Rome, N. Y. "Rome Quality." (Brass & copper.)  
 ★Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.  
 Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Tire rivets.)  
 Taunton Rivet Works, Taunton, Mass. (Brass, copper & iron.)  
 Waterbury Brass Goods Corp., The, 160 Washington Ave., Waterbury, Conn. (Brass.)  
 Waterbury Mfg. Co., Waterbury, Conn. (Brass & copper.)

**RIVETS, Platinum**

(See Platinum Rivets.)

**RIVET BURRS**

Wrought Washer Mfg. Co., Reynolds &amp; Wilcox Sts., Milwaukee, Wis.

**ROAD GUIDES**

- ★Baldwin Mfg. Co., The, 143 Federal St., Boston, Mass. "Baldwin." (On steering columns.)  
 Caron, J. Victor, Haverhill, Mass. "Caron."  
 Jones Live-Map Meter Co., 76th St. & Broadway, N. Y. City. "Jones Live-Map."  
 ★Rhodes, The J. B. Co., Kalamazoo, Mich. "Rhodes Pathfinder." (Automatic.)

**ROBES, Automobile**

- American Buffalo Robe Co., Buffalo, N. Y.  
 Automobile Apparel Co., 14 W. 22nd St., N. Y. City.  
 Beckman Co., The, 3167 Fulton Road, Cleveland, O. (Wool.)  
 Bishop, The J. H. Co., Wyandotte, Mich.  
 Burlington Blanket Co., Burlington, Wis. "Sho-Fur" & "Auto-Mat."  
 ★Chase, L. C. & Co., 89 Franklin St., Boston, Mass.  
 Chicago Auto Robe Supply Co., 157 Market St., Chicago, Ill. (Fur, cloth & plush; also "Spring-Belt" robes.)  
 Columbia Auto Top Co., 17 Dwight St., Springfield, Mass.  
 Curtis & Von Bernuth Mfg. Co., 88 W. Broadway, N. Y. City.  
 Davis Robe Co., Inc., 126 S. State St., Chicago, Ill. "Davis."  
 Draper Bros. Co., Canton, Mass. "Draper."  
 Dusenbury, Louis & Co., Inc., 79-81 Worth St., N. Y. City.  
 Hodgman Rubber Co., 806 Broadway, N. Y. City.  
 ★Hopewell Bros., 29 Chapel St., Newton, Mass. "Hopewell."  
 Kennedy, Willing & Co., 524 Arch St., Phila., Pa.  
 ★Mutt, L. J. Co., 28 Summer St., Boston, Mass. (Waterproof.)  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan." (Rubber.)  
 Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill.  
 Pontoosuc Woolen Mfg. Co., Pittsfield, Mass. "Pontoosuc." (Auto blankets.)  
 Raino Co., The, 1828-30 S. Halsted St., Chicago, Ill. "Raino."  
 Revillon, Freres, 19 W. 34th St., N. Y. City.  
 Rex Shield & Mfg. Co., Connersville, Ind. "Rex."  
 Spear-Martin Fur Co., 41 Church St., Burlington, Vt. "Spear's Adirondack."  
 Tuttle & Clark, Jefferson Ave., near Woodward Ave., Detroit, Mich.  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon." (Plain & with muff.)  
 ★Wallace, Hugh Co., 1680 Orleans St., Detroit, Mich.  
 Western Robe Mills, 43 Peck St., Chicago, Ill.  
 Wild, Joseph & Co., 366-370 Fifth Ave., N. Y. City.

**ROBE RAILS**

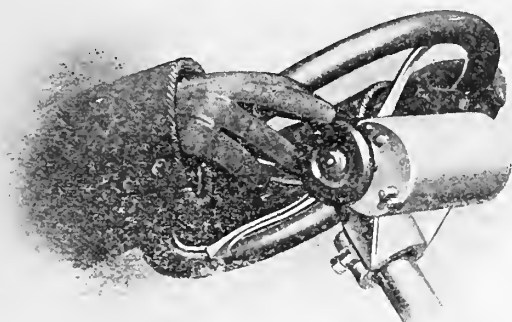
Adapt Machinery Co., The, 1620-30 Wabash Ave., Chicago, Ill.  
 Alexander, The J. Co., 1931 Broadway, N. Y. City.

**ROBE RAILS—Continued**

- Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.  
 Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich.  
 Auto Specialty Co., 85-87 Pearl St., Boston, Mass. (To order.)  
 B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, Ohio.  
 Baldwin & Overholt, Galesburg, Ill. "B. & O. Line."  
 Baum's Brass & Model Works, 244 Third Ave., S., Minneapolis, Minn.  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B. & R."  
 Boston Nickel Plating Co., Inc., 160 Portland St., Boston, Mass.  
 Central Brass & Fixture Co., The, Springfield, Ohio.  
 Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Amco."  
 Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 ★Douglas & Lomason Co., 302-10 Grand River Ave., Detroit, Mich.  
 Downing, Chas. J., 1777 Broadway, N. Y. City. "Downing."  
 Fickling & Co., 304-306 W. 49th St., N. Y. City.  
 Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
 Fowler Brass Works, The, Inc., 2333-35 Washburn Ave., Chicago, Ill.  
 Fries & Co., 91 Main St., Buffalo, N. Y.  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.

- ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, O. "Globe."  
 ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich.  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."  
 Hume Carriage Co., 66-68 Stanhope St., Boston, Mass.  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 ★Jonah & George, Merrimac, Mass.  
 Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
 Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill.  
 Lund, Smith Co., The, 51 Godwin St., Paterson, N. J.  
 M. A. N. Mfg. Co., 257 W. Exchange St., Providence, R. I. "Manco."  
 Machine Accessories & Novelties Mfg. Co., 257 W. Exchange St., Providence, R. I.  
 Medina Machine & Stamping Co., Medina, N. Y.  
 Metallic Specialties Co., 4228 Ludlow St., Philadelphia, Pa.  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Perfection."  
 Murdock, The James Jr. Co., 112 Opera Pl., Cincinnati, O. "Simplex." (Folding.)  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."  
 Novelty Mfg. Co., Maple St., Waterbury, Conn.  
 Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill. (Racks.)

# The Baldwin Auto Guide



is the newest departure in touring accessories. Does away with clumsy guide books and maps and will revolutionize the present method of touring by the hit or miss method.

The Baldwin instrument is attached to the steering column, **the one logical place for such a device.** Adjustable to any column. You can read the explicit directions very easily and you **operate the Baldwin with one finger**, without taking your hand from the steering wheel.

The Guide Holder here shown is 6 inches long and 3 inches in diameter, made wholly of brass and aluminum. Inside the holder are two brass reels operated by gears, the latter controlled by the hand wheel, a battery and a 2½ candle power light. The Baldwin Route Sheets are marvels of brevity and clearness, and the text is supplemented by arrows which point in the direction of the necessary turn or change of course.

The Baldwin Auto Guide had a "walkover" at both the New York and Boston Automobile Shows. We booked a large number of advance orders with only a model to demonstrate with. We shall be able to fill a few additional orders by April 15th, and live dealers are invited to write for terms, literature and sample route sheet. A limited number only of dealers and agents can be taken on in 1910.

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143 Federal St., Boston, Mass.

**ROBE RAILS—Continued**

- Polson, W. F., 27 Chenango St., Buffalo, N. Y.  
 "Polson."  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.  
 ★Smith, Jos. N. & Co., 4th & Porter Sts., Detroit, Mich.  
 Springfield Metal Body Co., 364 Birnie Ave., Springfield, Mass.  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.  
 Turner Brass Works, The, Sycamore, Ill.  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."  
 ★Victor Auto Supply Mfg. Co., 42 West 43rd St., N. Y. City. "Vasco."  
 Wall, R. C. Mfg. Co., 1334-36 Race St., Phila., Pa.  
 Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill.  
 Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal. "Western."  
 ★White Mfg. Co., 155 Cannon St., Bridgeport, Conn.  
 Woodruff, Walter W. & Sons Co., Mt. Carmel, Conn.

**ROBE RAIL BAGS**

(See Coat Rail Bags.)

**RODS, BARS, ETC.**

(See Raw Materials.)

**RODS, Steering**

(See Steering Rods.)

**ROLLER CHAINS**

(See Chains.)

**ROLLER BEARINGS**

- Auto Machinery Co., Ltd., Coventry, Eng.  
 Bantam Anti-Friction Co., Bantam, Conn.  
 "Bantam."  
 Bower Roller Bearing Co., 427-29 Valley St., Dayton, Ohio. "Bower."  
 Detroit Roller Bearing Co., 198 Piquette Ave., Detroit, Mich. "Zahn."  
 ★Hyatt Roller Bearing Co., Newark, N. J. "Hyatt."  
 ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.  
 ★Sparks-Withington Co., The, Jackson, Mich.  
 Standard Machinery Co., 7 Beverly St., Providence, R. I. "Mossberg."  
 Standard Roller Bearing Co., 50th & Lancaster Ave., Phila., Pa. "SRB."  
 ★Timken Roller Bearing Co., The, Canton, O. "Timken."  
 United States Roller Bearing Co., Room 1527, 25 Broad St., N. Y. City.

★ indicates Advertisers—see Index in back of book.

**ROPE**

- Bleecker, Augustus & Sons, 44 South St., N. Y. City.  
 Broderick & Bascom Rope Co., 809 N. Main St., St. Louis, Mo. (Wire.)  
 Macomber & Whyte Rope Co., 507-09 S. Clinton St., Chicago, Ill. "Monarch." (Steel wire.)

**RUBBER FITTINGS**

- Brooklyn Rubber Co., 397-401 Sumner Ave., Brooklyn, N. Y. (Rubber sheeting, auto.)  
 ★Goodrich, B. F. Co., Akron, O. (Cycle.)  
 ★Indiana Rubber & Insulated Wire Co., Jonesboro, Ind. (Auto cycle & motorcycle.)  
 Miller, Chas. E., Anderson, Ind. (Auto.)  
 Stevens & Co., 375 Broadway, N. Y. City. (Pedal rubber, cycle.)  
 ★Swinehart Tire & Rubber Co., Akron, Ohio.  
 Wald Mfg. Co., Sheboygan, Wis. "Wald." (Pedal rubber, cycle.)  
 Wilkie Rubber Mfg. Co., Lynn, Mass. (Auto.)

**RUBBER HOSE**

(See Hose.)

**RUBBER MATS**

(See Mats.)

**RUBBER PATCHES**

(See Tire Repair Articles.)

**RUBBER PLUGS**

(See Tire Repair Articles.)

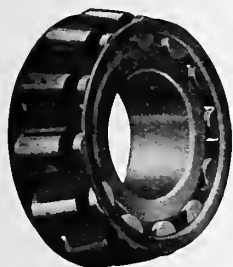
**RUBBER PRESERVATIVES**

- Auto & Aeronautic Supply Co., 2100 Broadway, N. Y. City. "Rubberwhite."  
 "Myhtib" Composition Co., 284 Asylum St., Hartford, Conn. "Myhtib."  
 Northwestern Chemical Co., Marietta, Ohio. "Tire-Lac."  
 Rubberlife Mfg. Co., Grand Rapids, Mich. "Rubberlife."

**RUBBER SPRING BUMPERS**

(See Bumpers, Spring.)





# Timken Roller Bearings

¶ The reputation for reliability is no mere happen-so, but the result of years of close study of the requirements of the customers we serve, fostered by an honest desire to serve them faithfully and well.

The Timken Roller Bearing Company  
CANTON, OHIO

**RUBBER TUBING**

(See Tubing, Soft Rubber.)

**RUDDERS, Boat**

(See Steering Apparatus, Boat.)

**RUNNING BOARDS**

- Auto Re-Building Co., 1307-09 Wabash Ave., Chicago, Ill. (Pressed steel.)  
 Berger Mfg. Co., Canton, Ohio.  
 ★Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich. "Presteel."  
 Holland Veneer Works, Holland, Mich.  
 Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.  
 Parish & Bingham Co., 5363 Hamilton Ave., Cleveland, O.

**RUNNING GEARS**

- ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.

**RUNNING GEAR FIXTURES**

- ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo. (Spring block bearings.)  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Spring hangers, cast steel to order.)  
 Columbus Bolt Works, 162 W. Randolph St., Columbus, O. (Axle clips & strut rods.)  
 Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich. (Radius rods.)  
 Electric Welding Products Co., The, Cleveland, O. (Reach rods, strut rods, truss rods & brace rods.)  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O. (Reach & torsion rods.)  
 Michigan Bolt & Nut Works, Foot of Meldrum Ave., Detroit, Mich. (Turnbuckles and axle clips.)  
 Neustadt Auto & Supply Co., 3948-50 Oliver St., St. Louis, Mo.

**RUST PREVENTIVES**

- ★Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill. "Helmet."  
 Cedaroleum Company, Perkinsville, Vt. "Cedaroleum." (Including lacquers for tools and machinery.)  
 Gardiner & Son, Geo. N., 15 William St., N. Y. City. "Gardiner's Anti-Rust Paint."

Houghton, E. F. & Co., 240 W. Somerset St., Phila., Pa. "Cosmic" & "African Slush."  
 Legnard Bros., 2103-05 Genesee St., Waukegan, Ill. "Ever-Bright."  
 Longhurst, Jas. S., Jr., Lynbrook, L. I., N. Y. "Micoline."  
 Sanders, Chas., 182 DeKalb St., Brooklyn, N. Y.  
 3-in-One Oil Co., 42 Broadway, N. Y. City. "3-in-1."

**SADDLES**

- Baker, F. A. & Co., 37 Warren St., N. Y. City. (Motorcycle.)  
 ★Hendee Mfg. Co., Springfield, Mass. "Brooks." (Motorcycle; imported.)  
 ★Mesinger, H. & F. Mfg. Co., 1801-1803 1st Ave., N. Y. City. "Mesinger." (Cycle.) & "Cavalry" & "Standard" (Motorcycle.)  
 Persons Mfg. Co., 54-68 Bloomingdale Road, Worcester, Mass. "Persons." (Cycle & motorcycle.)  
 Troxel Mfg. Co., Elyria, Ohio. "Troxel." (Cycle & motorcycle.)  
 Wolverine Leather Goods Co., 51-59 Fort St., East, Detroit, Mich. "Wheeler." (Cycle.)

**SADDLE CLAMPS**

- ★Mesinger, H. & F. Mfg. Co., 1801-3 First Ave., New York, N. Y.  
 Motorcycle Specialty Co., The, 258 Columbus Ave., Boston, Mass. (Spring saddle attachment, motorcycle.)  
 Persons Mfg. Co., 54-68 Bloomingdale Road, Worcester, Mass.

**SADDLE SPRINGS**

- ★Mesinger, H. & F. Mfg. Co., 1801-3 First Ave., N. Y. City. "Mesinger." (Shock absorbing attachment.)  
 Troxel Mfg. Co., Elyria, Ohio.

**SCHOOLS**

- Automobile Repair Co., 1103-05 Pine St., St. Louis, Mo.  
 Chicago School of Motoring, 1436 Wabash Ave., Chicago, Ill.  
 Correspondence School of Motor Car Practice, Tarrytown, N. Y.  
 ★Dyke's Correspondence School of Motoring, 3947 Washington Ave., St. Louis, Mo.  
 Empire Auto Institute, 935 Dake Bldg., Rochester, N. Y. (Correspondence.)  
 New York School of Automobile Engineers, Inc., 146 W. 56th St., N. Y. City.  
 Philadelphia Auto School 324 N. Broad St., Phila., Pa.  
 Stewart Automobile Academy, 231 W. 54th St., N. Y. City.

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Please send set Cyclopaedia of Automobile Engineering for five days' free examination; also Technical World for 1 year. I will send \$2.00 within five days and \$2.00 a month until I have paid \$12.80; or notify you and hold the books subject to your order. Title not to pass until fully paid.

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Cycle & Automobile Trade Journal—4-10

**SCRAP BUYERS**

Auto Waste Co., Box 262, Hartford, Conn.  
(Old outer shoes & inner tubes.)  
Birkenstein, S. & Sons, 60-70 Ontario St.,  
Chicago, Ill. (Metals of all kinds.)  
Metholoid Co., The, 288 Bowery, N. Y. City.  
(Celluloid scrap.)

**SCREWS**

American Screw Co., Providence, R. I.  
Atlas Bolt & Screw Co., 1289 Marquette Rd.,  
N. E., Cleveland, O. "Atlas."  
Bay State Screw Co., Hatfield, Mass.  
Bauer Machine Co., Jeffersonville, Ind.  
Bliss, R. Mfg. Co., Pawtucket, R. I. (Hand  
screws.)  
Chicago Screw Co., 1020-26 Homan Ave., Chi-  
cago, Ill.  
Cincinnati Screw & Tap Co., Twightwee, O.  
Clark Bros. Bolt Co., Milldale, Conn.  
Columbia Screw Co., 106th St. & Corliss Ave.,  
Chicago, Ill.  
Columbus Bolt Works, 162 W. Randolph St.,  
Columbus, O.  
★Corbin Screw Corporation, New Britain, Conn.  
Detroit Screw Works, Detroit, Mich. (Cap &  
set.)  
Eagle Lock Co., Terryville, Conn.  
Ferry Cap & Set Screw Co., 2151 Scranton  
Road, Cleveland, O. "Ferry." (Steel cap  
& set.)  
Haskell, Wm. H. Mfg. Co., 451 Main St., Paw-  
tucket, R. I.  
Hill, Geo. Q. Co., 326 A St., Boston, Mass.  
Hoopes & Townsend Co., 1330 Buttonwood  
St., Phila., Pa.  
Hubbell, Harvey, Inc., Bridgeport, Conn.  
"Hubbell."  
Hungerford, U. T. Brass & Copper Co., 497-  
503 Pearl St., N. Y. City. "Star."  
Keeler Brass Co., Grand Rapids, Mich.  
"Keeler."  
Kirk-Latty Mfg. Co., W. Madison Ave. & W.  
48th St., Cleveland, O. "Cleveland."  
(Wood.)  
La Buire Import Co., 123 W. 68th St., N. Y.  
City.  
Michigan Bolt & Nut Works, Foot of Meldrum  
Ave., Detroit, Mich.  
★National-Acme Mfg. Co., Cleveland, O. (Cap,  
set & machine.)  
National Screw & Tack Co., Cleveland, Ohio.  
"National."  
Ohio Tool Co., Columbus, Ohio.  
Parker, John L. Co., Worcester, Mass.  
Pawtucket Mfg. Co., 327 Pine St., Pawtucket,  
R. I.  
Peninsular Milled Screw Co., Champlain &  
Canton Aves., Detroit, Mich.  
Progressive Mfg. Co., Torrington, Conn. (Ma-  
chine.)  
Ramsdell Specialty Co., West Boylston St.,  
Cor. Eame Road, Worcester, Mass.  
Reading Screw Co., Norristown, Pa.  
Reed & Prince Mfg. Co., Duncan Ave., Wor-  
cester, Mass.  
Russell & Irwin Mfg. Co., 94-98 Lafayette St.,  
N. Y. City. (Set & cap.)  
St. Louis Screw Co., St. Louis, Mo.  
Schweppe & Wilt Mfg. Co., Meldrum & Cham-  
plain Sts., Detroit, Mich.  
Screw Machine Products Corporation, Cor.  
Eddy & Thurber Sts., Providence, R. I.  
Shimer, Samuel J. & Sons, Milton, Pa. (Set  
& cap.)  
Steele & Johnson Mfg. Co., 779 S. Main St.,  
Waterbury, Conn. (Thumb.)

Welch, Thomas F. Co., 55 Sudbury St., Bos-  
ton, Mass.  
Western Automatic Machine Screw Co., Ely-  
ria, Ohio.  
Worcester Machine Screw Co., Worcester,  
Mass.

**SCREW MACHINE PRODUCTS**

(For Screw Driving Machines see Ma-  
chinery, Misc.)  
Acorn Brass Mfg. Co., 227 N. Peoria St., Chi-  
cago, Ill.  
Alexander & Cox Co., Ogden & Western Aves.,  
Chicago, Ill. (Extra large.)  
Anthony Screw Co., 320 Chandler St., Worces-  
ter, Mass.  
Ashley Machine Works, 714 University Ave.,  
Rochester, N. Y.  
Atlas Bolt & Screw Co., 1289 Marquette Rd.,  
N. E., Cleveland, O. "Atlas."  
Attwood Brass Works, 18-20 Bowery St.,  
Grand Rapids, Mich.  
Bay State Screw Co., Hatfield, Mass.  
Biederman, C., 1555 Knox St., Cincinnati, O.  
Blair Tool & Machine Works, 24-27 West St.,  
N. Y. City.  
Blake & Johnson Co., Thomaston Ave., Wa-  
terbury, Conn.  
★Breeze Carburetor Co., 240 South St., Newark,  
N. J.  
Cassady-Fairbank Mfg. Co., The, 6106-6130  
La Salle St., Chicago, Ill.  
Chicago Screw Co., 1020-26 Homan Ave., Chi-  
cago, Ill.  
Chicago Steel & Brass Works, 1121-23 Wash-  
ington Blvd., Chicago, Ill.  
Cincinnati Ball Crank Co., 1644-46 Central  
Ave., Cincinnati, O.  
Cincinnati Screw & Tap Co., Twightwee, O.  
Clark Novelty Co., 380 Exchange St., Roches-  
ter, N. Y.  
Colonial Brass Co., New Haven, Conn.  
Columbus Screw & Machine Co., The, 244  
Kaiser St., Columbus, O.  
★Corbin Screw Corporation, New Britain, Conn.  
Crescent Tool Co., Jamestown, N. Y.  
Critchley Machine Screw Co., 100 Beacon St.,  
Worcester, Mass.  
Defiance Screw Machine Products Co., The,  
Defiance, O.  
Detroit Screw Works, Detroit, Mich. (Cups,  
nuts, coupling bolts, cones, axles, bear-  
ings, gear blanks, turnbuckles, spark  
plugs, hardened & ground parts.)  
Dover, Geo. W. Co., 67 Page St., Providence,  
R. I. (Small turned brass parts.)  
Driggs-Seabury Ordnance Corporation, Sha-  
ron, Pa.  
★Eclipse Machine Co., Elmira, N. Y.  
Electric Welding Products Co., The, Clevel-  
and, Ohio.  
Ellis Mfg. Co., Milldale, Conn.  
Elyria Machine Parts Co., Elyria, O.  
Fowler Brass Works, 2333-37 Wabash Ave.,  
Chicago, Ill.  
Fries & Co., 91 Main St., Buffalo, N. Y.  
Garvin Machine Co., Spring & Varrick Sts.,  
N. Y. City.  
Geometric Tool Co., Blake & Valley Sts., New  
Haven, Conn. "Geometric."  
Grammes, L. F. & Sons, Allentown, Pa.  
★Grant-Lees Machine Co., 6901 Quincy Ave.,  
Cleveland, Ohio.  
Hampden Machine Screw Co., Springfield,  
Mass.  
★Hancock Mfg. Co., 776 E. Henry St., Char-  
lotte, Mich.  
Harlow, Willard Mfg. Co., Janesville, Wis.

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**SCREW MACHINE PRODUCTS—Continued**

- Harris & Reed Mfg. Co., 1500-1518 W. 15th St., Chicago, Ill.  
 Hartford Machine Screw Co., The, Hartford, Conn. "Hartford."  
 Hill, Geo. Q. Co., 326 A St., Boston, Mass.  
 Ideal Switch Co., Inc., Plainville, Conn.  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 ★Jeffery-Dewitt Co., 217-219 High St., Newark, N. J.  
 Keeler Brass Co., Grand Rapids, Mich.  
 Keyless Lock Co., The, Indianapolis, Ind.  
 ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.  
 Lovell-McConnell Mfg. Co., 365 Market St., Newark, N. J.  
 M. A. N. Mfg. Co., 257 W. Exchange St., Providence, R. I.  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.  
 Machine Accessories & Novelties Mfg. Co., 257 W. Exchange St., Providence, R. I.  
 Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City.  
 ★Mechanical & Electrical Mfg. Co., Rear 2227 Prairie Ave., Chicago, Ill.  
 Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill.  
 ★Michigan Screw Co., The, Lansing, Mich.  
 ★Mossberg, Frank Co., Attleboro, Mass.  
 National-Acme Mfg. Co., The, Cleveland, O.  
 Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.  
 New Haven Machine Screw Co., New Haven, Conn.  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 ★Ohio Metal Products Co., Dayton, Ohio.  
 Osborn & Stephenson Mfg. Co., The, Plainville, Conn.  
 Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich.  
 Perry-Fay Mfg. Co., Elyria, Ohio.  
 Quidde Co., 1417 N. Salina St., Syracuse, N. Y.  
 Ramsdell Specialty Co., West Boylston St., Cor. Eames Road, Worcester, Mass.  
 Richards, F. H., 15 Murray St., N. Y. City.  
 Rutter, Arthur T. & Co., 256 Broadway, N. Y. City.  
 Schweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Providence, R. I.  
 Screw Machine Products Corp., Cor. Eddy & Thurber Sts., Providence, R. I.  
 ★Sier-Bath Co., 143 West 54th St., N. Y. City.  
 Sight Feed Oil Pump Co., Milwaukee, Wis.  
 Smith, M. I., Bristol, Conn.  
 Smith, F. H. Mfg. Co., Carroll Ave. & St. John's St., Chicago, Ill. (To order.)  
 Somers, Fittler & Todd Co., 327 Water St., Pittsburg, Pa.  
 U. S. Automatic Co., Amherst, O.  
 Waterbury Mfg. Co., Waterbury, Conn.  
 Western Automatic Machine Screw Co., Elyria, Ohio.  
 Woburn Gear Works, 32 Nashua St., Woburn, Mass.

**SEARCHLIGHTS**

(See Lamps.)

**SEAT BENDINGS**

(See Bendings, Wood.)

**SEAT CUSHIONS**

(See Cushions, Seat.)

**SEATS, Automobile**

- A-Z Co., The, 527-9 W. 56th St., N. Y. City.  
 "A-Z." (Metal.)  
 Ahr & Rost Co., 1559-69 Gest St., Cincinnati, Ohio. (Wood & metal.)  
 American Auto Top Mfg. Co., 1608-12 W. Lake St., Chicago, Ill. (Folding auxiliary.)  
 Amesbury Brass & Foundry Co., Amesbury, Mass.  
 Amesbury Reed & Rattan Co., Bailey Bldg., Amesbury, Mass. (Auxiliary, rattan.)  
 Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. "20th Century." (Extra tonneau & rumble.)  
 Auto Body & Taxicab Co., 1648 Broadway, N. Y. City. (Extra.)  
 Auto Top & Body Co., 249 N. Watts St., Phila., Pa. (Auxiliary.)  
 ★Barndt-Johnston Auto Supply Co., The, 408-426 Donaldson St., Columbus, Ohio. (Auxiliary & runabout.)  
 ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Metal.)  
 Brown Folding Stool Co., 27 Dock Square, Boston, Mass. "Brown." (Folding stool.)  
 Buffalo General Mfg. Co., 1239 Niagara St., Buffalo, N. Y. "Koen's." (Folding chairs.)  
 Buffington, H. A. & Co., Berkshire, N. Y. "Y." (Folding seats.)  
 Carriage Woodstock Co., The, Owensboro, Ky.  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel spring seats to order.)  
 Cincinnati Panel Co., The, Cincinnati, Ohio.  
 Cranmer, Harry C., 217 S. 24th St., Phila., Pa. (Folding.)  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn. (In the white.)  
 Dayton Auto Top Co., Dayton, Ohio. "Myers."  
 Dayton Body Co., 618-24 Geyer St., Dayton, Ohio. (Extra tonneau, rumble & artillery seats & folding tonneaus.)  
 Diamond Seat & Body Co., 1004-12 E. 18th St., Kansas City, Mo.  
 Elsner Auto Seat Co., Racine, Wis. "Elsner." (Supplementary.)  
 Fellwock Automobile & Mfg. Co., The, Evansville, Ind. "Fellwock" & "Maxwell." (Surrey & rumble.)  
 Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City. (Also extra seats.)  
 Frantz Body Mfg. Co., Akron, O.  
 Freeman, The Geo. B. Mfg. Co., 1415 Racine St., Racine Junction, Wis. "Freeman." (Auxiliary seats & folding steel chairs.)  
 Gem Mfg. Co., Chelsea Station, Boston, Mass. (Steel.)  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O. (Metal.)  
 Graves & Congdon Co., Carriage Ave., Amesbury, Mass. "Luxury." (Revolving auxiliary chairs.)  
 Hill Mfg. Co., The, 25-27 Fuller St., Buffalo, N. Y. "Hill." (Auxiliary revolving & folding.)  
 Holbrook-Singer Co., 509-515 W. 56th St., N. Y. City. (Auxiliary.)  
 Howarth & Rogers Co., Oak St., Amesbury, Mass. (Also auxiliary.)

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**SEATS, Automobile—Continued**

- Hume Carriage Co., 66-68 Stanhope St., Boston, Mass. (Folding.)  
 Kalamazoo Steel Goods Co., Kalamazoo, Mich. "Kalamazoo." (Stools & chairs.)  
 Kimball, C. P. & Co., 315-317 Michigan Ave., Chicago, Ill. (Folding.)  
 McKinnon Dash Co., Amherst St., Buffalo, N. Y. "McKinnon." (Folding.)  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Peerless." (Folding.)  
 Miller, A. J. & Co., Bellefontaine, O.  
 Mullholland Co., Dunkirk, N. Y.  
 Myers Auto Top Co., The, S. E. cor. First & St. Clair Sts., Dayton, O.  
 Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O. (Sheet metal.)  
 Powitsky & Collins Carriage Woodwork Co., St. Louis, Mo.  
 Reliable Radiator Co., 451 E. 173rd St., N. Y. City. (Metal.)  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. (Auxiliary chairs.)  
 ★Schubert Bros. Gear Co., 44 Cedar St., Oneida, N. Y. "Schubert." (Aluminum, sheet steel or wood.)  
 Tucker Wood Work Co., Sidney, Ohio. (Seat bendings.)  
 Union City Body Co., 232½ Columbia St., Union City, Ind.  
 York Wagon Gear Co., Belvidere Ave. & P. R. R., York, Pa.

**SEATS, Boat**

- Amesbury Reed & Rattan Co., Bailey Bldg., Amesbury, Mass. (Rattan.)  
 Ford & Johnson Co., The, Chicago, Ill. (Fibre-rush chairs & furniture.)  
 Heywood Bros. & Wakefield Co., Boston, Mass. (Rattan chairs.)  
 Hill Mfg. Co., The, 25-27 Fuller St., Buffalo, N. Y. "Hill."  
 Irwin Mfg. Co., Galesburg, Ill. "E-Z."  
 Newburgh Reed Co., Newburgh, N. Y. (Wicker chairs.)

**SEAT POSTS, Cycle & Motorcycle**

- Ideal Plating Co., Inc., Marlboro, Mass. "Ideal."  
 Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.  
 ★Standard Welding Co., The, 76th St. N. W., & L. S. & M. S. R. R., Cleveland, O.

**SECONDARY WIRE**

(See Ignition Cable.)

**SECOND HAND AUTOMOBILES**

- Automobile Clearing House, 238 Michigan Ave., Chicago, Ill.

- Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.  
 ★Broadway Automobile Exchange, Inc., 36 W. 60th St., N. Y. City.  
 Dixon Motor Car Co., 776 Main St., Buffalo, N. Y.  
 Johnson Automobile Co., 4390 Olive St., St. Louis, Mo.  
 Manhattan Storage Co., 1611 Broadway, N. Y. City.  
 Massachusetts Automobile Co., 52 Church St., Boston, Mass.  
 ★Nyberg Auto Co., 2437-39 Michigan Ave., Chicago, Ill.  
 Reliable Auto Exchange, E. Washington St., Indianapolis, Ind.  
 Times Square Automobile Co., 215-217 W. 48th St., N. Y. City.  
 Wall, R. C. Mfg. Co., 1334-36 Race St., Phila., Pa.

**SEPARATORS, Bow**

(See Bow Separators.)

**SEPARATORS, Gasoline**

(See Strainers, Gasoline.)

**SHAFTS, Cam**

(See Cam-Shafts.)

**SHAFTS, Counter**

(See Counter-Shafts.)

**SHAFTS, Crank**

(See Crank-Shafts.)

**SHAFTS, Propeller**

(See Propeller Shafts.)

**SHEAVES**

- Biddison Mfg. Co., The, 1516 Williamson St., Madison, Wis.

**SHEET METAL ARTICLES**

- A-Z Co., The, 527-29 W. 56th St., N. Y. City.  
 "A-Z." (Sprocket & step covers.)

**SHEET METAL ARTICLES—Continued**

Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.  
 Ashley Machine Works, 714 University Ave., Rochester, N. Y.  
 Auto Sheet Metal Works, 2228 Michigan Ave., Chicago, Ill.  
 Bossert Co., The, Utica, N. Y. (To order.)  
 Bush Mfg. Co., 81 Commercial St., Hartford, Conn.  
 Childs, S. D. & Co., 200 Clark St., Chicago, Ill. (Brass, steel & aluminum articles.)  
 Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O.  
 Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich.  
 Ellis Mfg. Co., Milldale, Conn. (On contract.)  
 Folsom, C. G. Mfg. Co., South Bend, Ind.  
 Gem Mfg. Co., Chelsea Station, Boston, Mass. (Auto & motorcycle.)  
 Gender, Paeschke & Frey Co., St. Paul Ave. & 15th St., Milwaukee, Wis. (To order.)  
 ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, O.  
 Grubb, Charles Edmund, 819 Fourth Ave., Altoona, Pa.  
 Hampden Machine Screw Co., Springfield, Mass.  
 Heggie-Woodruff Pressed Steel Co., Joliet, Ill.  
 Hill Dryer Co., 344 Park Ave., Worcester, Mass. (To order.)  
 Hunt & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O.  
 Kinsey Mfg. Co., Toledo, O. "Kinwood."  
 Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City.  
 Matthews Mfg. Co., 104 Gold St., Worcester, Mass.  
 ★Mayo Radiator Co., The, State & Mill River St., New Haven, Conn. "Mayo."

Osborn & Stephenson Mfg. Co., The, Plainville, Conn.  
 Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J. (Brass, aluminum, steel, tin, etc.)  
 Rome-Turney Radiator Co., Rome, N. Y. (Brass & copper.)  
 Rutter, Arthur T. & Co., 256 Broadway, N. Y. City.  
 Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City.  
 Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
 U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. (Carbide cans, etc.)  
 Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass.  
 Wrought Washer Mfg. Co., Reynolds & Wilcox Sts., Milwaukee, Wis.

**SHELLAC**

★Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y. "Hosmers." (Liquid shellac.)  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Puro." (Rim.)

Established 1899

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at prices ranging from \$175 to \$3000. A high-grade used car, thoroughly rebuilt, made as good as new, and offered for one-half (or less) of its original price, is better value than a new car of the same price. Every car thoroughly rebuilt in our own shops and guaranteed. Before you buy write for our catalogue of rebuilt and new cars. We handle 15 makes of new cars.

**WE WANT AGENTS****Nyberg Automobile Works, Inc.**

Dept. B., 2437-2439 Michigan Ave., Chicago.



## SHIMS

- Detroit Leather Works, 844 Woodward Ave., Detroit, Mich. (Leather.)  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. (Motor.)

## SHOCK ABSORBERS

- American Spring & Supply Co., 135 Johnson St., Brooklyn, N. Y.  
 Ball Bearing Shock Absorber Co., 25 Broad St., N. Y. City.  
 Behrman-Baron Co., 1777-79 Broadway, N. Y. City. "Ciglia."  
 Bi-Cal-Ky Auxiliary Spring Co., 866 Prospect Ave., Buffalo, N. Y. "Bi-Cal-Ky."  
 Bolton, Geo. W., 260 Wreford Ave., Detroit, Mich. "Detroit."  
 ★Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. "Thomas."  
 Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."  
 Cormack, M. H. & Co., Motor Mart Bldg., N. Y. City. "Super-Coil." (Bumpers.)  
 F.R.V. Sales Co., The Thoroughfare Bldg., N. Y. City. "F.R.V."  
 Flentje, Ernst, Cambridge & Trowbridge Sts., Cambridge, Mass. "E. Flentje." (Glycerine.)  
 ★Gabriel Horn Mfg. Co., 1407 E. 40th St., Cleveland, O. "Gabriel" & "Foster."  
 ★Hartford Suspension Co., 150 Bay St., Jersey City, N. J. "Truffault-Hartford."  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Pater Noster."  
 Indianapolis Bolster Spring Co., 326 W. Georgia St., Indianapolis, Ind.  
 Jar-less Shock Absorber Co., The, 172 Oliver St., Boston, Mass. "Jar-less."  
 Kidder, Wellington P., 40-46 Station St., Brookline, Mass. "Monarch."  
 ★Kilgore Mfg. Co., 585 Boylston St., Boston, Mass. "Kilgore."  
 Knapp-Greenwood Co., 1000 Boylston St., Boston, Mass. "Boston."  
 Lawrence & Welch, Sterling, Ill. "L. & W."  
 Mellen-Edwards Co., 403 Grand Ave., Beloit, Wis. "Auto-Cushion" & "Air-Cushion."  
 Merritt, F. W., Room 211, 1777 Broadway, N. Y. City. "Merritt."  
 ★Mesinger, H. & F. Mfg. Co., 1801-03 First Ave., N. Y. City. "Mesinger." (Rebound check springs.)  
 National Jack & Mfg. Co., 132-34 S. Clinton St., Chicago, Ill.  
 New York Wire & Spring Co., 586-88 Washington St., Hoboken, N. J.  
 Oil Tempering Spring Co., Chicopee Falls, Mass. "Napoleon."  
 Panhard & Levassor, Broadway & 62nd St., N. Y. City. "Phenix." (Imported.)  
 Phillips Mfg. Co., 60 Wall St., N. Y. City. "Velvet."  
 Safety Tire Gauge Co., 1463 Michigan Ave., Chicago, Ill. "Safety."  
 ★Sager, J. H. Co., 265 South Ave., Rochester, N. Y. "Sager." (Equalizing springs) & "Peerless" (shock absorbers.)  
 Shippey, Geo. E. Co., 220 First St., Pittsfield, Mass.  
 Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill. "Skinner." (Recoil checks.)  
 Supplementary Spiral Bumper Co., 1876 Broadway, N. Y. City. "Supplementary Spiral Springs."  
 ★Supplementary Spiral Spring Co., The, 4524-26 Delmar Ave., St. Louis, Mo. (Supplementary spiral springs.)

"Ride on Air"



Patented in U. S. A. and all foreign countries  
 New York Branch, 1926 Broadway, Room 408  
 Pennsylvania Agency, C. E. Loveland, 107 Reily St., Harrisburg, Pa.

# KILGORE

## Improved Automobile Air Shock Absorbers

**Lead All Others in  
Quality, Durability and Efficiency**

Mechanically correct in every detail and now being adopted by the leading automobile companies. Unlike liquid and friction devices, the Kilgore does not stiffen the spring action. The excessive motion, both on the downward plunge and recoil, is absorbed automatically in a cushion of air.

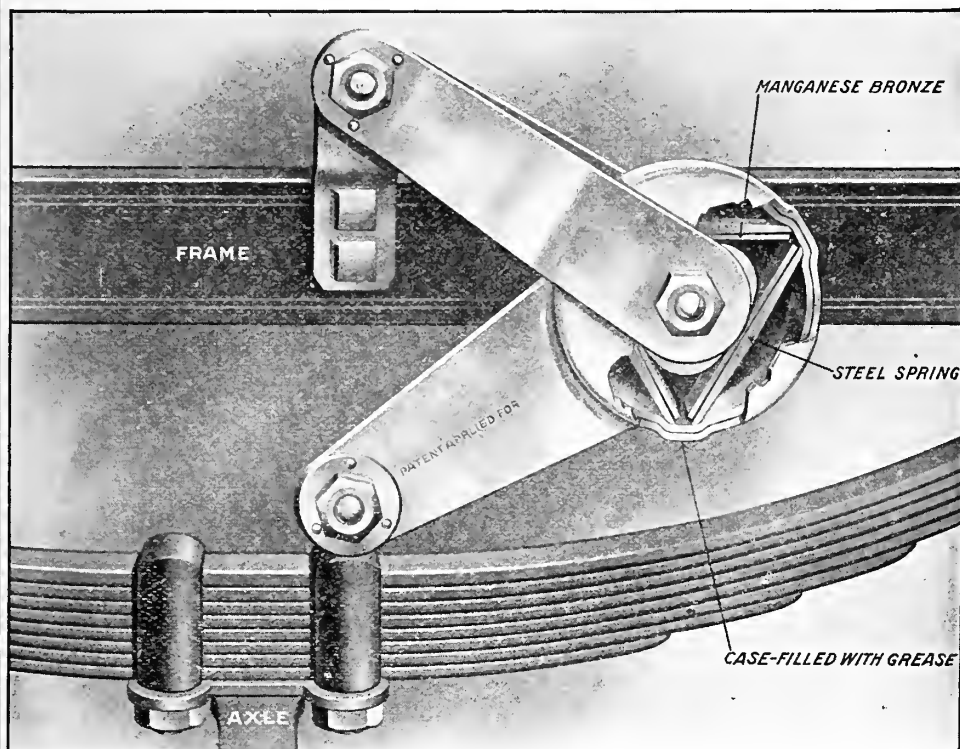
The only shock absorbing device in the world that requires no attention. Combines the maximum of comfort with the minimum of upkeep expense.

**30 DAYS' TRIAL ONE YEAR GUARANTEE**

For further particulars, catalogues, price lists, testimonials, etc., apply immediately to the

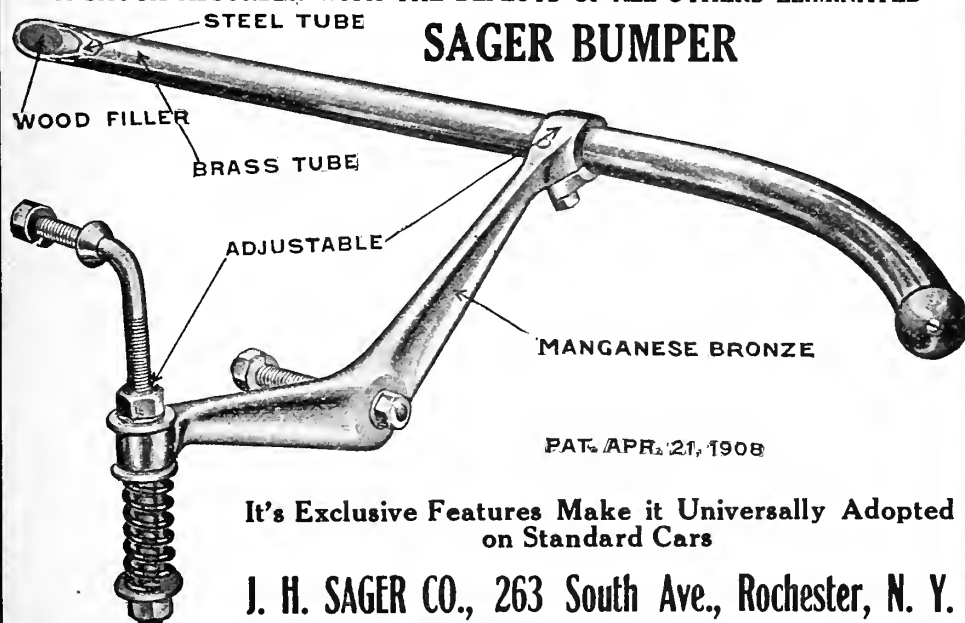
**Kilgore Manufacturing Company**  
 585 Boylston St., Copley Sq., Boston, Mass.  
 Chas. R. Evans, President Fred O. Kilgore, V. P.

# PEERLESS



A SHOCK ABSORBER WITH THE DEFECTS OF ALL OTHERS ELIMINATED

## SAGER BUMPER



It's Exclusive Features Make it Universally Adopted  
on Standard Cars

J. H. SAGER CO., 263 South Ave., Rochester, N. Y.

### SHOCK ABSORBERS—Continued

Toops Automobile Hood Co., The, Indianapolis, Ind. "Toops." (Compound spring & shock absorber.)  
 Triple Action Spring Co., 215-217 E. 21st St., Chicago, Ill. "Triple Action."  
 Vehicle Shock Absorber Co., 115 S. Broadway, St. Louis, Mo.  
 Weeber, C. F. Mfg. Works, 170-172 Central Ave., Albany, N. Y. "Weeber."  
 Westen Mfg. Co., 290 Halsey St., Newark, N. J. "Westen."

### SILENCERS

(See Mufflers.)

### SIREN HORNS

(See Horns.)

### SIDE CAR & DELIVERY ATTACHMENTS

Armec Motor Co., 472 Carroll Ave., Chicago, Ill. "Armec."  
 Brown & Beck, 1437 Fremont St., Denver, Col. "Apache."  
 ★Consolidated Mfg. Co., The, Toledo, O. "Consolidated." (Package attachments.)  
 Goddard, R. W. Co., 15 Abbott Street, Worcester, Mass. "Goddard."  
 ★Hendee Mfg. Co., 837 State St., Springfield, Mass. "Indian."  
 ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "N. S. U." (Also fore car attachments.)  
 ★Reading Standard Co., Reading, Pa. "R. S."

### SKID DEVICES, for Pulling Out of Mud Holes

★Auto Draft Co., Lake City, Minn. "Auto Draft." (Cable & drum.)  
 Reynolds, Harry H., 1205 Monadnock Block, Chicago, Ill. "Reynolds."

### SIGHT FEEDS

Charter & Co., Hoopeston, Ill. "Charter."  
 ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich.  
 Greene, Tweed & Co., 109 Duane St., N. Y. City.  
 Krahn Mfg. Co., Milwaukee, Wis.  
 ★Lunkenheimer Co., The, Cincinnati, Ohio.  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.  
 Michigan Lubricator Co., 661-671 Beaubien St., Detroit, Mich. (Dash.)  
 Pedersen Mfg. Co., 636-44 First Ave., N. Y. City.  
 ★Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.

### SLAT IRONS

(See Top Irons.)

### SLIP COVERS

(See Covers, Upholstery.)

### SIGNS

Baltimore Enamel & Novelty Co., Foot of Allen St., Baltimore, Md. (Road and destination signs.)  
 Balzer, Gus, 1777-79 Broadway, N. Y. City.  
 Electro-Chemical Engraving Co., 450-58 18th St., Brooklyn, N. Y.  
 Etching Co. of America, 2526-28 W. Congress St., Chicago, Ill. (Brass.)  
 Ingram-Richardson Mfg. Co., Beaver Falls, Pa. "Ing-Rich." (Porcelain enameled iron.)  
 Kaufmann, Chas., 28 Main St., Oshkosh, Wis. (Brass.)  
 Meyercord Co., The, 1107-12 Chamber of Commerce Bldg., Chicago, Ill.  
 Newark Brass Plate Engraving Co., 45 Lawrence St., Newark, N. J.  
 Raimes & Co., 50 Ferry St., N. Y. City. (Taxicab for hire.)  
 Schridde, Wm., 35 S. Clark St., Chicago, Ill. (Radiator.)  
 Stafford, N. Co., 67 Fulton St., N. Y. City.  
 Whiteford, Jos. G. & Co., 165 N. Jefferson St., Chicago, Ill.

### SNOW SHOES, Auto

Raimes & Co., 50 Ferry St., N. Y. City. "Erickson."

### SOAPS

(See Cleansing Compounds.)

### SOAPSTONE

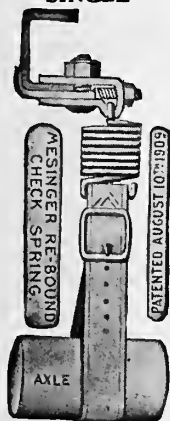
(See Talcs or Chalks, Tire.)

★ indicates Advertisers—see Index in back of book.

# THE MESINGER REBOUND : : : CHECK SPRINGS

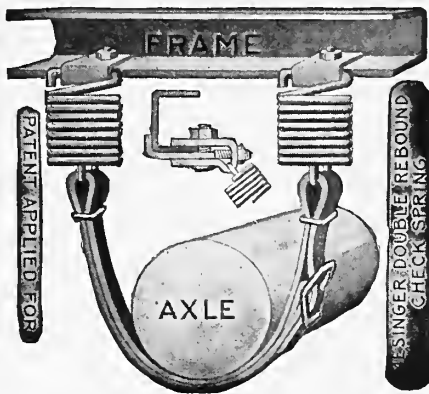
**GUARANTEED TO WEAR SATISFACTORY TO CONSUMER**  
**CAN BE ATTACHED IN TEN MINUTES**

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Will save your car and yourself from violent shocks. Get a set, or pair. It's money well spent. Clamps on the frame. Simple and most effective.

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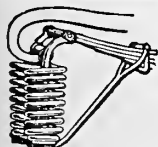


Price, per pair  
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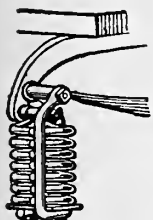
Price, per pair  
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**H. & F. MESINGER MANUFACTURING COMPANY**  
 1801-1807 First Avenue, New York

## SUPPLEMENTARY SPIRAL SPRINGS



No. 1  
Curved Hanger,  
body loop

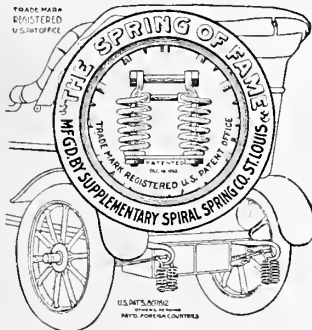


No. 2  
Outside Hanger,  
carrying spring  
on Stud End



No. 3  
Full Elliptic

Over 25,000 Cars Equipped Since 1903



They Make You Comfortable

**That's  
Something,  
Isn't It?**

They Also Save Expense  
**That  
Counts  
Too!**

In ordering state Model, Make and Year of Car.  
 Send for our Booklet—Complete and interesting.

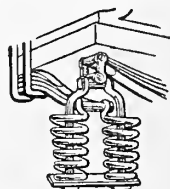
**Supplementary Spiral Spring Co.**

Main Office and Factory:

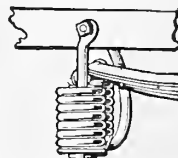
**4522 DELMAR AVENUE  
 ST. LOUIS, MO.**

New York Office:

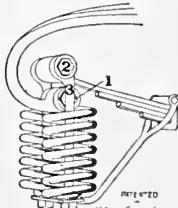
202 Motor Mart Building, 62d St. and Broadway  
 Boston: 893 Boylston Street Chicago: 237 Randolph Street  
 Pacific Coast: 424 Stanyan Street, San Francisco, Cal.  
 Toronto, Can.: T. Eaton Co., 190 Yonge Street



No. 4  
Platform Spring



No. 5  
Shackles attached direct to spring ABOVE spring end used on front.



No. 7  
Scroll End Spring

**SOLDER**

(See also Aluminum Solder.)

- Allen, L. B. Co., Inc., 1353 Columbia Ave., Chicago, Ill. "Allen." (Flux, paste, salts, liquid & stick.)
- Benson, Alex. R. Co., Hudson, N. Y. "Yagers." (Flux.)
- Birkenstein, S. & Sons, 60-70 Ontario St., Chicago, Ill.
- Blake Signal & Mfg. Co., 246 Summer St., Boston, Mass. "Blake." (Soldering flux.)
- Blatchford, E. W. Co., Chicago, Ill.
- Bliss, E. C. Mfg. Co., 91 Sabin St., Providence, R. I.
- Burnley Battery & Mfg. Co., North East, Pa. "Burnley." (Soldering flux, paste, salts & sticks.)
- Callahan, Geo. & Co., 218 Front St., N. Y. City. "Callahan's Non-Corrosive." (Fluid.)
- Columbia Smelting & Refining Works, 365 West St., N. Y. City. "Columbia." (Bar and wire.)
- Como Electrical Co., Spring Lake, N. J. "Hiko." (Soldering sticks.)
- Crescent Co., Valparaiso, Ind. "Star." (Stick & paste.)
- Dunton, The M. W. Co., Providence, R. I. "Nokorode." (Soldering paste.)
- Gardiner Metal Co., 1356-64 W. Lake St., Chicago, Ill.
- Grasselli Chemical Co., Cleveland, Ohio. ("Standard" & "Eureka" flux & "Snow Flake" salt.)
- Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."
- International Solder Co., The, Syracuse, N. Y. "International." (Wire & half and half.)
- Millett Brass Co., Highland Station, Springfield, Mass.
- Ney, The J. M. Co., Hartford, Conn. (Silver.)
- Reade Mfg. Co., Hoboken, N. J. "Incomparable." (Fluid.)
- Reinhold No Flux Aluminum Solder Co., 50 Demarest St., Newark, N. J. (Combination.)
- Ruby Chemical Co., Johnstown, Ohio. "Ruby Fluid." (Flux.)
- Schultz, A. & Co., 1015-19 E. Fayette St., Baltimore, Md. "Excelsior." (Soldering fluid.)
- Shi-Nal Co., 413 Emmet Road, Toledo, Ohio. "Superior Quality." (Soldering flux.)
- Solderine Co., 37 Hartford St., Boston, Mass. "Solderine." (Sticks, flux & paste.)
- Syracuse Smelting Works, N. Y. City. (Half and half.)
- Taylor, N. & G. Co., 308 Chestnut St., Phila., Pa.
- Uniform Seamless Wire Co., 71 Peck St., Providence, R. I. (Brass, silver sheet & wire.)
- United Wire & Supply Co., 109 Summer St., Providence, R. I. (Wire & sheet solder.)
- Universal Fluxine Co., Urbana, Ohio. "Universal Soldering Fluid."
- Webb Mfg. Co., Front & Centre Sts., Newark, N. J. "Nokorode." (Fluid.)
- Western Electric Co., The, 465 West St., New York, N. Y. "Hawthorne." (Paste, salts & sticks.)
- Wildes, Thomas Son, 21 Maiden Lane, N. Y. City. "Semper Idem." (Bismuth.)

**SPARE WHEELS**

- Black Mfg. Co., 118-20 W. Wayne St., Fort Wayne, Ind.
- Crone, F. G., 49 E. Utica St., Buffalo, N. Y. "Crone."
- ★Jenkins Emergency Wheel Co., Inc., 405-06 American Bank Bldg., Richmond, Va. "Jenkins."
- Spare Motor Wheel of America, Ltd., St. Anne, Ill. "Stepney."
- U. S. Spare Wheel Co., Detroit, Mich. "United States."

**SPARK COILS**

- Acme Motor Parts Co., Lafayette, Ind. "Acme." (Auto & two battery motor cycle coils.)
- American Coil Co., Foxboro, Mass. "American."
- American Electrical Works, Phillipsdale, R. I.
- American Electric Fuse Co., Muskegon, Mich. "American Igniter."
- Andrae, Julius & Sons Co., 118-20 Sycamore St., Milwaukee, Wis. "Andrae."
- Autocoil Co., The, 132-136 Seventh St., Jersey City, N. J. "Autocoil."
- Ball-Fintze Co., The, Newark, Ohio. "Avallion."
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Hornet."
- Bunnell, J. H. & Co., 20 Park Place, New York, N. Y.
- Cartridge Coil Co., Lafayette, Ind. "Cart-ridge." (Also motorcycle coils.)
- Central Insulating Co., Lafayette, Ind.
- Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut." (Auto, marine & motorcycle.)
- Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."
- Duplex Coil Co., The, Fond du Lac, Wis. "Duplex" & "Comet."
- Eisner, Harry & Co., 29 Scotia St., Boston, Mass. "Eisner."
- Electric Goods Mfg. Co., Canton, Mass. "Per-fex."
- Fish Systems Co., The, Indianapolis, Ind. "Fish Systems."
- Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."
- ★Heinze Electric Co., Lowell, Mass. "Heinze."
- ★Herz & Co., 203-205 Lafayette St., N. Y. City. (French.)
- ★Holtzer-Cabot Electric Co., The, Boston, Mass.
- Jacobson-Brandow Co., 126 Columbus Ave., Pittsfield, Mass. "J & B."
- ★K-W Ignition Co., The, 40 Power Ave., Cleveland, Ohio. "K-W."
- Knoblock-Heideman Co., South Bend, Ind. "Quick Action." (Also primary.)
- Kokomo Electric Co., The, Kokomo, Ind. "Kingston."
- Leece-Neville Co., Cleveland, Ohio.
- Leland, W. H. & Co., Worcester, Mass. "Worcester."
- Lemke-Briggs Electric Co., 9, 10, 11 Miller Bldg., Milwaukee, Wis. "L-B." (Auto & motorcycle.)
- McKibbin, Geo. N., 49 Elmwood Ave., S. Norwalk, Conn. "Maclet."
- Manhattan Electrical Supply Co., 17 Park Place, N. Y. City. "Mesco" & "Manhattan."
- Menominee Electric Mfg. Co., Menominee, Mich.
- Morss, A. S. Co., 210-212 Commercial St., Boston, Mass. "Morss." (Waterproof marine.)

**SOLID TIRES**

(See Tires, Solid.)

★ indicates Advertisers—see Index in back of book.



TIRE "BUSTED"—  
All Confusion—  
Time Lost—  
—THEN WHAT?

## THE JENKINS EMERGENCY WHEEL

will eliminate the worries incident to tire puncturing. It is a worthy acquisition to the list of recent auto accessory inventions. Its simplicity makes it wonderfully invaluable. A child can install it in 10 minutes after the car is jacked up.

This wheel is strong, practically unbreakable and will center itself and run true on all automobiles.



Through its installation, delays are forgotten, repairs are unnecessary, and tire changing is made a thing of the past.

Besides—

## BIGGER PROFITS FOR THE DEALER

Write for our handsome booklet "*Where Tire Troubles End*"—it gives all information, including prices, liberal discounts, to Auto Supply Houses, Garage Owners and the trade generally.

Address:

The Jenkins Emergency Wheel Co., Inc.

—General Offices—

405 American National Bank Bldg.

Richmond - Virginia

U. S. A.



**SPARK COILS—Continued**

- National Carbon Co., The, Lock Drawer L, Cleveland, O.  
 National Coil Co., 412 Michigan Ave., E., Lansing, Mich.  
 ★New York Coil Co., 338 Pearl St., N. Y. City.  
 Nilmelior Electrical Co., 1789 Broadway, N. Y. City. (Imported.)  
 Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. "Record."  
 Noxon, C. Per Lee, 500 E. Water St., Syracuse, N. Y. "Single Spark Vibrator."  
 Osburn Electric Co., 66 Fort St., East, Detroit, Mich. "Osburn."  
 ★Pfanstiehl Electrical Laboratory, North Chicago, Ill. "Pfanstiehl." (Auto & motorcycle.)  
 ★Pittsfield Spark Coil Co., Dalton, Mass. "Pittsfield."  
 Schug Electric Mfg. Co., 320 Jefferson Ave., Detroit, Mich.  
 ★Splitdorf, C. F., 261-265 Walton Ave., N. Y. City. "Splitdorf." (Auto & marine.)  
 Thordarson-Electric Mfg. Co., 216-20 Jefferson St., Chicago, Ill. "Thordarson."  
 Tritt Electric Co., The, Union City, Ind. "Rapid Fire" & "Veribest."  
 Unit Coil Co., The, 15 Exchange Place, Jersey City, N. J.  
 United States Wheel & Rim Co., Ltd., St. Anne, Ill. "Stepney."  
 Western Electric Co., The, 465 West St., New York, N. Y.  
 Williams, E. L., 537 S. Clinton St., Syracuse, N. Y. "Williams."

**SPARK COIL BOXES**

(See Battery &amp; Coil Boxes.)

**SPARK COIL PARTS**

Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.

**SPARK GAPS**

- ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Oscillum."  
 New England Sales Co., The, 454 Old South Bldg., Boston, Mass. "Phelps."  
 Point Spark Plug Co., The, 112-114 11th Ave., S. E., Aberdeen, S. D. "The Point."

**SPARK LEVER GRIPS**

(See Grips, Throttle &amp; Spark Lever.)

**SPARK PLUGS**

- Acme Telephone & Mfg. Co., Albia, Iowa. "Flash."  
 Adams, S. E. & Co., 114 Bowers St., Jersey City Heights, N. J.  
 Albright Mfg. Co., Columbus, Ga. "All-Right."  
 American Coil Co., Foxboro, Mass. "Indestructible" & "American."  
 American Machine Co., Eau Claire, Wis. "Indian."  
 Anderson Spark Plug Co., 100 Boylston St., Boston, Mass. "Anderson Glass."  
 Artistic Porcelain Co., Trenton, N. J.  
 Artizan Brass Co., 204 Lincoln Park Blvd., Chicago, Ill. "ABC."  
 Autolyte Mfg. Co., 26 Warren St., N. Y. City. "Red Cross."  
 ★Automobile Equipment Co., The, 260 Jefferson Ave., Detroit, Mich. "LXV."  
 Auto Specialties Mfg. Co., 656-658 3rd St., Milwaukee, Wis. "Meteor," "Ajax" & "Simplex."  
 Backe Commutator Co., 33 Herkimer Place, Brooklyn, N. Y. "Backe."  
 Ball Multi-Spark Plug Co., The, 202-08 1st St., S., Aberdeen, S. Dak. "Ball Multi-Spark Plug."  
 Bay State Screw Co., Hatfield, Mass.  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Quickfire," "Victor," "High Duty," "Copper Head" & "Diamond."  
 Benford, E. M., Mt. Vernon, N. Y. "Monarch."  
 ★Best Ignition Equipment Co., 200 W. 64th St., N. Y. City. "Best."  
 Biederman, C., 1555 Knox St., Cincinnati, O.  
 Blake Electrical Co., 88 Purchase St., Boston, Mass. "Red Cross" & "Shawmut."  
 ★Bosch Magneto Co., 223-225 W. 46th St., N. Y. City. "Bosch."

**SPARK PLUGS**

"Conqueror," \$1.75 "Conqueror, Jr.," \$1.00  
 "Mammoth," \$1.25 "Torpedo," \$1.00  
 and  
 "Vulcano," \$1.00

**TO THE TRADE**

We offer our entire output of above brands of plugs with exclusive Selling Right. Big discount offered. We do not retail.

We also make to order the highest compressed mica core, guaranteed gas, oil and leakage proof. Estimates cheerfully furnished.

Non-collapsible mica tubes.

Ask for Our Booklet  
 "Mica Versus Porcelain Insulation"

**O. K. MICA CORE CO.**

Dept. D.

23 Fulton St. Brooklyn, N. Y.

★ indicates Advertisers—see Index in back of book.



**SPARK PLUGS—Continued**

Breakstone, S., 1712 Michigan Ave., Chicago, Ill. "Edco." (Imported.)  
 ★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.  
 Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich. "Buffalo."  
 Bunnell, J. H. Co., 20 Park Place, N. Y. City.  
 Burnham Spark Plug Co., E. Edgecomb, Me. "Burnham." (Hooded.)  
 Cartridge Coil Co., Lafayette, Ind.  
 Central Insulating Co., Lafayette, Ind.  
 Champion Ignition Co., Flint, Mich. "A C."  
 Charter & Co., Hoopeston, Ill. "Charter."  
 Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Handy."  
 Cincinnati Spark Plug Co., 1555 Knox St., Cincinnati, O. "Cincinnati."  
 Comet Electric Mfg. Co., Detroit, Mich. "All-In-One."  
 ★Delta Mfg. Co., The, Bloomfield, N. J. "Delta" & "B. O. E."

Dien, Ch., 45 W. 34th St., N. Y. City. "Edco." (Imported.)  
 Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."  
 Enterprise Machine Co., 1114-22 S. Third St., Minneapolis, Minn.  
 ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "X.L.C.R."  
 Fairmount Automobile Co., 126-128 East King St., Lancaster, Pa. "Sure Spark."  
 Geer, Harry R. Co., 856 McLaran St., St. Louis, Mo.  
 Goodson Electric Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."  
 Grammes, L. F. & Sons, Allentown, Pa.  
 Grant Mfg. & Machine Co., The, 90 Sillman Ave., Bridgeport, Conn. "Empire."  
 Grossman, Emil Co., 232 W. 58th St., N. Y. City. "Red Head."  
 Hagstrom Bros. Mfg. Co., Lindsborg, Kans. "Hagstrom."



No. 4 A

Double Porcelain  
separable  
Price, \$1.00

**WHAT?**

**\$1.00 per  
cylinder for  
1910, 1911  
and 1912?**

**Yes, Sir!**

**By sending us  
attached cou-  
pon before**

**May 1st, 1910**

**GUARANTEE**

Date . . . . .

To The R. E. Hardy Co.  
Manufacturers  
1735 Michigan Ave., Chicago

Gentlemen:—

I enclose \$4.00 as deposit for  $\frac{4}{6}$  "Sta-Rite" plugs, including plug box worth 75c. It is agreed that if at end of ten days after their receipt I am not satisfied that they are the **snappiest** and most **powerful** plugs ever used in my . . . . . car, using magneto or battery ignition, that I may return them to you, and you will refund the money promptly and cancel the order. It is **also agreed** that you will repair these plugs **free**, any time I return them **prepaid**.

Name . . . . .

Address . . . . .

My Dealer's Name is . . . . .

# New York Coil Company

Manufacturers of Spark Coils of every description for the Ignition of Gas and Gasolene Engines and also for Wireless Telegraphy.

Write us for prices

**New York Coil Company, 338 B Pearl St., New York City**

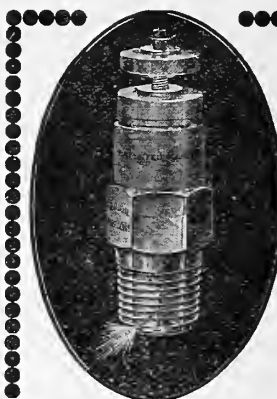
Western Distributors

FACTORY SALES CORPORATION

235 E. Randolph St., Chicago, Ill.

**SPARK PLUGS—Continued**

- Hampton Roads Cutlery Co., The, Box 552, Norfolk, Va. "Baker."
- ★Hardy, The R. E. Co., 201 37th St., Brooklyn, N. Y. "Sta-Rite," "Gotham" & "Venus."
- Harlow, Willard Mfg. Co., Janesville, Wis.
- ★Heinze Electric Co., Lowell, Mass.
- ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Bougie Mercedes."
- Igniter Appliance Co., The, 302 Electric Bldg., Cleveland, Ohio. "Ilades, Jr."
- Jacobson-Brandon Co., 126 Columbus Ave., Pittsfield, Mass. "The Imp."
- ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. "Flash Light."
- ★Jeffery-Dewitt Co., 217-219 High St., Newark, N. J. "Reliance," "J.-D." & "Edison."
- Jones, Major Motor Co., 74 Sproat St., Detroit, Mich. "Major Jones."
- ★K-W Ignition Co., 40 Power Ave., Cleveland, O. "K-W."
- Knapp-Greenwood Co., 1000 Boylston St., Boston, Mass. "Winestock."
- Knoblock-Heideman Mfg. Co., South Bend, Ind. "Quick Action."
- Kokomo Electric Co., Kokomo, Ind. "Kings-ton."
- Kokomo Mold & Model Works, Kokomo, Ind.
- Legnard Bros., 203-05 Genesee St., Waukegan, Ill. "Auto-Marine" & "Legnard."
- ★Lehman, J. H. Mfg. Co., 500 5th Ave., N. Y. City. "Lehman."
- Lenike-Briggs Electric Co., 9, 10, 11 Miller Bldg., Milwaukee, Wis. "L-B."
- Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis. "Billy Hell."
- Lockwood Ash Motor Co., Jackson, Mich.
- Long Bros., Broadway & Buckeye St., Kokomo, Ind.
- Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J. "H.P."
- ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McCord."
- Metzger, C. A., Inc., 239 W. 56th St., N. Y. City. "Soot-Proof."
- Mica Core Mfg. Co., 442 E. 166th St., N. Y. City. "Mephisto," "Diablo," "Eccentric" & "Circle Fyre."
- Miller, Chas. E., 97-101 Reade St., N. Y. City. "Miller." (Mica & porcelain.)
- Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis. "Milwaukee."
- Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Centerfire" & "Victor."
- Moline Pump Co., Moline, Ill. "Moline."
- Montgomery & Co., 105-107 Fulton St., N. Y. City. "Bougie Eyquem."
- ★Monroe Electrical Mfg. Co., Monroe, Mich. "Monroe."
- ★Mosler, A. R. & Co., 163 W. 29th St., N. Y. City. "Spit Fire," "Triumph," "Vesuvius" & "Beat-M-All."
- Motor Car Equipment Co., The, 55 Warren St., N. Y. City. "Pognon," "DeDion," "A.V." & "Oleo."
- ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "N. S. U." (Motorcycle.)
- National Automatic Fender & Appliance Co., 100 Boylston St., Boston, Mass. (Water-proof marine.)
- ★National Coil Co., 412 Michigan Ave., E., Lansing, Mich.
- National Steel Products Co., The, Lorain, Ohio. "Blue Blaze," "Cleveland Shoots-a-Flame," "Rapid Fire" & "Steel King."
- ★Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss."
- New York Mica & Mfg. Co., 122 Clark St., Auburn, N. Y. "Auburn" & "Wright."
- Nilmelior Electrical Co., 1789 Broadway, N. Y. City. (Imported.)



# The Herz Plug

"Bougie Mercedes" for the past 16 years has been considered the BEST PLUG made in Europe or America.

# The Herz Plug

"Bougie Mercedes" is the ONLY plug which is really guaranteed for one entire year. They last two to three years.

It's Double Stone

# The Herz Plug

"Bougie Mercedes" needs no cleaning, no taking out of motor. Forms part of the motor, same as the valves. Not affected by oil or soot.

# The Herz Plug

"Bougie Mercedes" is the best Plug on the market in Europe or America and has been so the past 16 years. \$1.50 at all dealers or at

**Herz & Co.**  
295 Lafayette Street  
NEW YORK

See our ad., page 278.



# VOLCANO SPARK PLUGS

The Plug you will like,—the one that  
will stay in your engine longest

ALL SIZES ALL STYLES  
\$ 1 . 0 0

**Volcano Spark Plug Co.**  
Ashland, Ohio



**DON'T STAND IN YOUR  
OWN LIGHT**

**Never-Miss Spark Plugs  
for 1910**

**Mean Satisfaction or  
Money Back**

Your trade appreciates this kind of a plug—  
why not boost for a plug that you can make  
more friends, and more money with.

**Never-Miss, No. 8. Sells at \$1.00 each**

Guaranteed for 365 days' actual service. 1/2-inch  
Metric, 3/8-18 A. L. A. M. Extension Type and  
Magneto. All sizes, \$1.00.

Write your nearest jobber to-day or dealer.  
If he is wide-awake he will supply you; if he  
won't, "write us."

**MR. MANUFACTURER:** Let us quote you  
—it will be \$\$\$\$ in your pocket—then  
Never-Miss satisfaction.

**START 1910 RIGHT. WITH NEVER-MISS  
YOU ARE RIGHT.**

Never-Miss Ammeters, Battery Connections,  
Wire Terminals, Spark Plug Boxes (new), Auto  
Clocks, etc., etc.

We furnish cuts and free advt. "Write today."



**Never-Miss Spark Plug Co. :: Lansing, Mich.**

**SPARK PLUGS—Continued**

- Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. "Record."
- North & Pfeiffer Mfg. Co., Rear 169 Main St., New Britain, Conn.
- ★O. K. Mica Core Co., 23 Fulton St., Brooklyn, N. Y. "Conqueror," "Conqueror, Jr.," "Mammoth," "Torpedo" & "Vulcano."
- Oakes & Dow Co., 15 Chardon St., Boston, Mass. "Comet" & "Sootless."
- Osborn Electric Co., 66 Fort St., East, Detroit, Mich. "Osborn."
- Pettingell-Andrews Co., 156-160 Pearl St., Boston, Mass. "O.K."
- Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo.
- ★Pittsfield Spark Coil Co., Dalton, Mass. "Jewel."
- Point Spark Plug Co., The, 112-114 11th Ave., S. E., Aberdeen, S. D. "The Point."
- ★Rajah Auto Supply Co., Bloomfield, N. J. "Rajah."
- Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.
- Reflex Ignition Co., 825 Columbia Bldg., Cleveland, O. "Reflex."
- Schenectady Spark Plug Co., 1259 State St., Schenectady, N. Y. "Schenectady."
- Schug Electric Mfg. Co., 320 Jefferson Ave., Detroit, Mich. "Schug."
- ★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal. "Hi-Fre-Co."
- Seidler-Miner Supply Co., 207-11 Jefferson Ave., Detroit, Mich. "S-M Positive."
- Shain, Chas. D., 70 Murray St., N. Y. City. "Shain's."
- Sharp, J. & W. & Co., Cleveland, Ohio. "Sharp."
- Sherman, G. S. & Son, 419 St. Aubin Ave., Detroit, Mich. "Sherman."
- Smith, J. Stewart, 1779 Broadway, N. Y. City. "Dollar."
- ★Splitdorf, C. F., 261-265 Walton Ave., N. Y. City. "Common-Sense." (Auto & motor cycle.)
- ★Standard Co., The, Torrington, Conn. "Breech-Block."
- Standard Sales Co., 123 W. 68th St., N. Y. City. "Fry."
- Stoddard, C. H., 10 Waldo St., Worcester, Mass. "Sterling" & "Windsor."
- Strang, Lewis Supply Co., 2230 Broadway, N. Y. City. "That Strang."
- ★Superior Motor Specialty Co., 526 Jefferson St., Phila., Pa. "Superior."
- ★Toffler S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.
- Tritt Electric Co., The, Union City, Ind. "Kangaroo."
- Utility Co., The, 636-38 West 44th St., N. Y. City. "Utility" & "Uko."
- ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."
- ★Victor Auto Supply Mfg. Co., 42 West 43rd St., N. Y. City. "Vasco."
- ★Volcano Spark Plug Co., Ashland, Ohio. "Volcano."
- Wachman Auto Mfg. & Supplies, 372 Michigan Ave., Detroit, Mich. "Sure Fire."
- Waite Auto Supply Co., 17 Dorrance St., Providence, R. I. "Success."
- Westchester Appliance Co., 13-15 Canal Pl., Bronx Borough, N. Y. "Diamond."
- Western Electric Co., The, 465 West St., New York, N. Y.
- Widmayer, F. B. Co., 2312 Broadway, N. Y. City.
- Williams, E. Q., 537 Clinton St., Syracuse, N. Y.
- Witherbee Igniter Co., 1876 Broadway, N. Y. City. "Wico."
- Wolff, Alfred & Co., 45 Vesey St., N. Y. City. (Imported.)

**SPARK PLUG CASES**

- Cook, E. C. & Bro., 49 E. Kinzie St., Chicago, Ill.
- Denver Auto Goods Co., The, Denver, Colo. "D. A. G."
- Gilbert Mfg. Co., New Haven, Conn. "Gilbert."
- ★Hopewell Bros., 29 Chapel St., Newton, Mass.
- ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."
- Stillman, A. P., 124 Chambers St., N. Y. City. J. A. W."

**SPARK PLUG MICAS & PORCELAINS**

(See Insulation.)

**SPARK PLUG PARTS**

- Bay State Screw Co., Hatfield, Mass. (Metal.)
- Biederman, C., 1555 Knox St., Cincinnati, O.
- Grammes, L. F. & Sons, Allentown, Pa.
- Hill, Geo. Q. Co., 326 A St., Boston, Mass.
- Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. (Bushings.)

**SPARK PLUG PROTECTORS**

- Dandy Mfg. Co., 30 Church St., N. Y. City. "Dandy." (Rubber hood.)
- ★Hardy, The R. E. Co., 201 37th St., Brooklyn, N. Y. "Sta-Rite."
- Mattson Rubber Co., 161 Columbus Ave., Lodi, N. J.
- ★Mosler, A. R. & Co., 163 W. 29th St., N. Y. City. "Mosler." (Marine.)
- ★National Steel Products Co., The, Lorain, O. "Cleveland."
- Plug Umbrella Co., 70 Long Wharf, Boston, Mass. "Plug Umbrella."
- ★Rajah Auto Supply Co., Bloomfield, N. J. "Rajah."
- Stuart, C. H., Newark, N. Y.

**SPARK & THROTTLE LEVERS**

(See Levers, Spark and Throttle.)

**SPARKING POINT CLEANERS**

- McKibbin, Geo. N., 49 Elmwood Ave., S. Norwalk, Conn. "Maclet."

**SPEAKING TUBES**

(See Annunciators.)

**SPECIALISTS**

- Peck, Francis J. & Co., 7th Floor Williamson Bldg., Cleveland, O. (Analytical & consulting chemists, assayers & engineers of tests.)

# SPARK PLUGS

BLOOMFIELD, N.J.

## We Are

**Ashamed** to admit that *we* have *not* booked orders for 3,631,276 Spark Plugs since January first, but it leaves us in position to give *your* order some attention.

Reported sales of plugs by sundry other manufacturers lead us to believe that considerable quantities are now being used as parlor ornaments, for track ballast, to fill in swamp lands, and in other ways our salesmen have been slow in discovering.

They also explain what absorbed that big surplus of idle freight cars the railroads were complaining of only a few months ago, and why all the steel mills are running over time, though now and again we seem to detect an odor closely resembling in volume and temperature the unmuffled exhaust from a six cylinder.

## It Is

**Humiliating** to have also to acknowledge that *our* plug was *not* born so absolutely perfect five years back as to make it impossible (for us) to improve it. On the contrary, we are *unable to deny* that the plug we are turning out today is so far ahead of the one we made in 1904 that the relationship is scarcely recognizable.

We have seen *enough new business* so far this year to encourage the belief that we will at least not have to lay off any of our help, and if we get so busy that we *can't keep up with the orders* we won't waste money in renting expensive space in the trade papers to *say so*, and *solicit more business*.

In the meantime, if you have use for a thoroughly dependable Spark Plug (Every one a Magneto plug this year) with five years' development and a well-equipped plant back of it, we suggest the "Delta."

**The Delta Manufacturing Co.**  
Bloomfield, N. J.

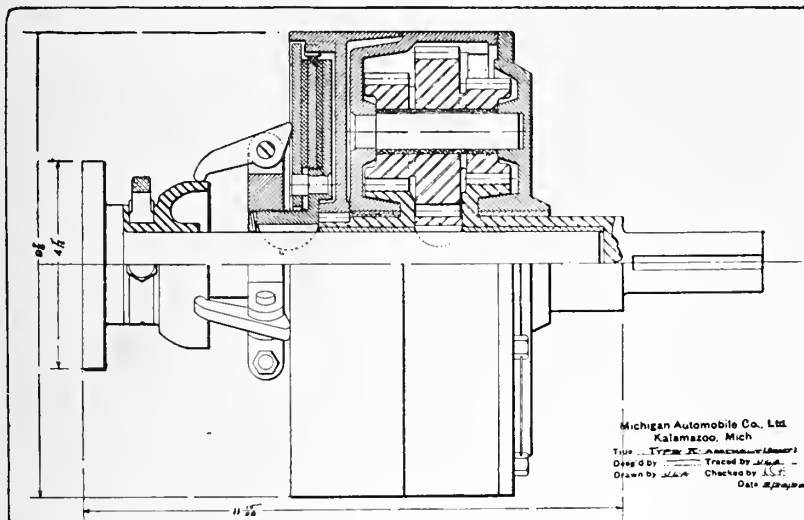
## SPECIAL WORK

- A-Z Co., The, 527-9 W. 56th St., New York City. (Copper work.)
- Ashley Machine Works, 714 University Ave., Rochester, N. Y. (Grinding.)
- Bettcher Mfg. Co., Cleveland, O. (Tinning & galvanizing.)
- Bliss, E. C. Mfg. Co., 91 Sabin St., Providence, R. I. (Die work, punching & embossing.)
- Bridgeport Electro Plating Co., 125 Kossuth St., Bridgeport, Conn. (Galvanizing.)
- Buffalo Galvanizing & Tinning Works, 43-53 Jackson St., Buffalo, N. Y. (Galvanizing and tinning.)
- Chandler Co., The, Inc., 31 Taylor St., Springfield, Mass. (Die sinking.)
- Clark Novelty Co., 380 Exchange St., Rochester, N. Y. (Experimental work.)
- Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, Ohio. (Galvanizing and tinning.)
- Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O. (Brass work.)
- ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (Brass work.)
- ★Cramp, The Wm. & Sons S. & E. B. Co., Beach & Ball Sts., Phila., Pa. (Galvanizing.)
- Crowe Name Plate & Engraving Co., Grace St. & E. Ravenwood Park, Chicago, Ill. (Die cutting.)
- Dwight Slate Machine Co., Hartford, Conn. (Letter cutting.)
- Etching Co. of America, 2526-28 W. Congress St., Chicago, Ill. (Enameling & japanning.)
- Ford Auto Equipment Co., Inc., 1735 Michigan Ave., Chicago, Ill. (General repairing & blacksmithing.)
- Gem Mfg. Co., Chelsea Station, Boston, Mass. (Galvanizing & tinning.)
- Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. (Experimental work.)
- Goodwin & Kintz Co., Winsted, Conn. (Sheet brass work, to order.)
- Grabler Mfg. Co., Cleveland, O. (Galvanizing.)
- Grubb, Charles Edmund, 819 Fourth Ave., Altoona, Pa. (Tin, copper & sheet metal work.)
- Holbrook-Singer Co., 509-515 W. 56th St., N. Y. City. (Iron & steel work on autos.)
- Jordan, Edward B. & Co., 129 De Graw St., Brooklyn, N. Y. (Wood work, to order.)
- Manufacturers & Inventors Electric Co., 82-84 Nassau St., N. Y. City. (Inventors' models; experimental work.)
- Meeker Co., 218-24 N. Elizabeth St., Chicago, Ill. (Galvanizing.)
- Michigan Bolt & Nut Works, Ft. of Meldrum Ave., Detroit, Mich. (Galvanizing.)
- Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. (Models & experimental work.)
- Pokorney, B. W. Co., 134 S. Clinton St., Chicago, Ill. (Experimental brass work.)
- Pugh, Owen J., 26 Washington St., Buffalo, N. Y. (Model work.)
- Puritan Machine Co., 72-74 Brush St., E., Detroit, Mich. (Model & experimental work.)
- ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa. (Galvanizing.)
- Syracuse Plating Works, 312 East Water St., Syracuse, N. Y. (Enameling.)
- United States Electro-Galvanizing Co., 1-9 Park Ave., Brooklyn, N. Y. (Galvanizing.)
- Universal Machinery Co., 1916 St. Paul Ave., Milwaukee, Wis. (Grinding, tool & jig work.)
- Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass. (Cold rolling & punching.)

## SPEED CHANGE GEARS

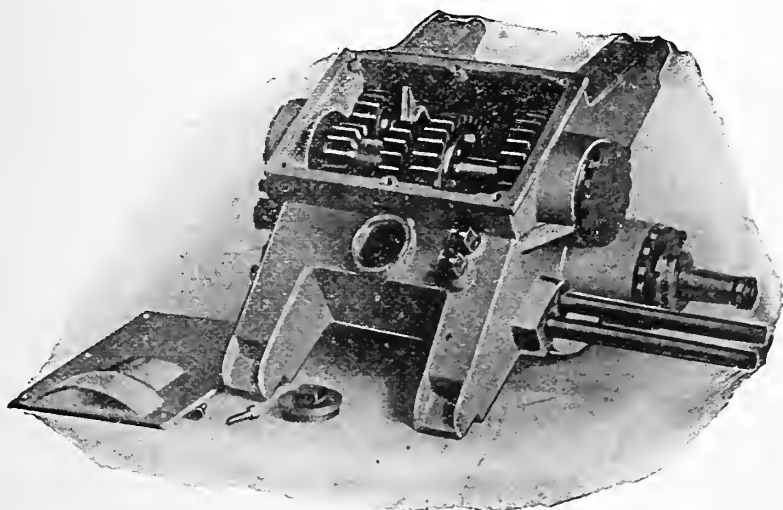
- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
- ★American Die & Tool Co., Reading, Pa.
- American Machine Co., Eau Claire, Wis.
- ★Anderson Motor Co., The, 16th & Jackson Sts., Anderson, Ind. "Anderson."
- Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich.
- Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich. "Autoart."
- Auto Parts Mfg. Co., South Elliott St. & T. E. W. R., Muncie, Ind. "B.T.K."
- Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.
- Black Mfg. Co., 118-20 W. Wayne St., Fort Wayne, Ind. (Friction.)
- ★Boston Gear Works, Norfolk Downs, Mass.
- ★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. "Brown-Lipe."
- Bridgeport Chain Co., Bridgeport, Conn. "Triumph," "Brown," "Perfection" & "Monarch." (Weldless chains.)
- ★Brownell, F. A. Motor Co., 634-666 Lexington Ave., Rochester, N. Y.
- ★Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y. "Browne-Lipe."
- Bultman, The F. H. Co., 2103 Superior Ave., N. W., Cleveland, O. "Bultman."
- Cameron, F. F. Co., Hinsdale, N. H. "Cameron."
- Chester Engineering & Machine Co., Front & Penn Sts., Chester, Pa.
- Clark, E. C. Motor Co., Jackson, Mich.
- Climax Electric Works, New Salem, Mass. "Climax." (Friction.)
- Continental Engine Co., Chicago, Ill.
- Continental Motor Mfg. Co., Muskegon, Mich.
- Cotta Transmission Co., 814-18 S. Main St., Rockford, Ill. "Cotta."
- Covert Motor Vehicle Co., Lockport, N. Y. "Covert."
- Cross Gear & Engine Co., 800-806 Bellevue Ave., Detroit, Mich.
- Delphi Machine Works, Delphi, Ind.
- Direct Drive Mfg. Co., 505 Odd Fellows' Bldg., Indianapolis, Ind. (Friction.)
- F.R.V. Sales Co., The, Thoroughfare Bldg., N. Y. City. "F.R.V." (Hydraulic.)
- ★Frost Gear & Machine Co., Jackson, Mich.
- Ganschow, Wm. Co., Washington Blvd. & Morgan St., Chicago, Ill.
- Garrett Machine Works Co., Garrett, Ind.
- ★General Mfg. Co., The, Elkhart, Ind.
- ★Grant-Lees Machine Co., 6901 Quincy Ave., Cleveland, O.
- Gunderson-Walter Co., The, 182-94 Bellevue Ave., Detroit, Mich.
- ★Hazard Engineering Co., Maple & Scherer Sts. & C. & P. R. R., Rochester, N. Y.
- Industrial Automobile Co., The, Elkhart, Ind. & P. R. R., Cleveland, O.
- Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.
- Johnston & Jennings Co., 877 Addison Road, Cleveland, Ohio.
- Krefeld Steel Co., 50 Church St., N. Y. City.
- Krupp (Thos. Prosser & Son), P. O. Box 878, G. P. O. New York City.
- Lauth-Juergens Motor Car Co., 528 Elston Ave., Chicago, Ill.
- Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. "M. A. B." (Imported.)
- ★Liggett Spring & Axle Co., Park Bldg., Pittsburg, Pa.
- ★Long Arm System Co., E. 38th St. & Lakeside Ave., Cleveland, O.
- Long Distance Telephone Mfg. Co., South Bend, Ind. (To order only.)
- Manly Drive Co., Whitehall Bldg., N. Y. City. (Hydraulic.)
- Meisel Press & Mfg. Co., 944 Dorchester Ave., Boston, Mass.
- ★Merchant & Evans Co., 517 Arch St., Phila., Pa. "Evans."

Here is a cut of our **Type "K" (Shaft Drive) Planetary Transmission**



Made also for Chain Drive. 12 to 20 H. P. The best for Light Delivery Wagons.

**Michigan Automobile Co., Ltd., Kalamazoo, Mich.**



**SELECTIVE TYPE AUTOMOBILE TRANSMISSION GEARS. STYLE 3V, 60 H. P. AND LOWER**  
**STYLE 33V, 35 H. P. AND LOWER**

Made in both vertical and horizontal types and fitted with annular ball bearings, as specified. The gears are made of chrome nickel steel, hardened, treated and ground to size; the shifter rods are fitted with an automatic inner-lock, making it impossible to mesh two gears at one time; the rods are also fitted with registering pawls to automatically lock sliding gears in and out of mesh. All parts are interchangeable. We make many other different types transmission to fit any car. Our work is of the highest type only. Write us for prices and detailed information.

**AMERICAN DIE AND TOOL CO.,**

**Reading, Pa., U. S. A.**



**SPEED CHANGE GEARS—Continued**

- ★Michigan Automobile Co., Kalamazoo, Mich. "Michigan."
- Michigan Auto Parts Co., 1559-1561 Jefferson Ave., W., Detroit, Mich.
- Miller Bros., 2331 N. Talman Ave., Chicago, Ill.
- Milwaukee Motor Co., 32nd & Burleigh Sts., Milwaukee, Wis.
- ★Model Gas Engine Works, Peru, Ind.
- Muncie Gear Works, Muncie, Ind. "Muncie."
- Munsing Motor Car Co., Hoboken, N. J. "Munsing."
- Murray Machine Works, Winchester & Wabansia Aves., Chicago, Ill.
- National Engineering Co., Saginaw, Mich.
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- New England Gear Works, 100 Purchase St., Boston, Mass. "N. E."
- ★New Process Raw Hide Co., 500 Plum St., Syracuse, N. Y. "New Process."
- New Process Steel Co., 210 W. River St., Marshall, Mich. (Crucible steel.)
- ★New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y. (Ball.)
- Northway Motor & Mfg. Co., Maybury Ave., Detroit, Mich.
- ★Ohio Brass Co., Mansfield, Ohio. (Brass work, to order.)
- Oswald Motor Co., Goshen, Ind.
- Parkinson Gear Co., Rensselaer, Ind. "Parkinson."
- Providence Engineering Works, 521 S. Main St., Providence, R. I.
- Puritan Machine Co., 72-74 Brush St., E., Detroit, Mich. "Puritan." (On contract.)
- Quride Co., 1417 N. Salina St., Syracuse, N. Y. "Quride."
- Redington, F. B. Co., 112-114 S. Sangamon St., Chicago, Ill.
- Robson Mfg. Co., Galesburg, Ill.
- Salem Iron Works, Winston-Salem, N. C.
- Scott-Harris Engine & Transmission Co., Board of Trade Bldg., Indianapolis, Ind.
- Seitz Automobile & Transmission Co., 225-29 Beecher Ave., Detroit, Mich. "Seitz."
- Sintz, Guy L. Co., Marshall, Mich. "Sintz." (Planetary.)
- ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.
- ★Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
- Stecker Electric & Machine Co., Detroit, Mich. "Oliver."
- Sterling Engine Co., 108-110 N. Clinton St., Chicago, Ill.
- Stutz Auto Parts Co., 10th St. & Canal, Indianapolis, Ind. "Stutz."
- Superior Machine Tool Co., Kokomo, Ind. "Superior."
- Syracuse Gear Co., 105 Grape St., Syracuse, N. Y. "Syracuse."

- Torbensen Motor Car Co., 610 Bloomfield Ave., Bloomfield, N. J. "Torbensen."
- Trojan Motor Co., Louisville, Ky. "Trojan."
- Wabash Gear Works, Terre Haute, Ind.
- ★Warner, T. W. Co., Muncie, Ind.
- ★Warner Gear Co., Muncie, Ind. "Warner."
- ★Warner Mfg. Co., Toledo, O.
- ★Waukesha Motor Co., Waukesha, Wis.
- ★Widmer Machine Works, Inc., 292-94 E. 135th St., N. Y. City.
- ★Yuster Axle & Transmission Co. of America, South Bend, Ind.

**SPEED CHANGE LEVERS**

(See Levers, Speed Change.)

**SPEED INDICATORS, Auto**

- ★Auto Improvement Co., The, 304 Hudson St., N. Y. City. "Ever Ready."
- Bullard Specialty Co., Springfield, Mass. "Bullard."
- ★Cleveland Speed Indicator Co., 1806 Euclid Ave., Cleveland, Ohio. "Cleveland."
- ★Couch & Seeley Co., 10 Thacher St., Boston, Mass. "Casgrain."
- Electric Speedometer & Dynamometer Co., The, 1317-19 New York Ave., N. W., Washington, D. C. "Dynatak." (Also tachometers.)
- Excelsior Tire Co., 1777 Broadway, N. Y. City. "Riverside."
- Hoffecker Co., Park Sq. Motor Mart, Boston, Mass. "Hoffecker." (Combined with odometer.)
- Industrial Instrument Co., Foxboro, Mass. "Horn." (Tachometers & tachographs.)
- Jones Speedometer, The, Broadway & 76th Sts., N. Y. City. "Jones."
- Loring Auto Appliance Co., 42 W. 43rd St., N. Y. City. "Loring." (And odometers combined.)
- Motor Car Specialty Co., Lamberton & Lalor Sts., Trenton, N. J. "Lea Speedimeter." (With odometer & clock combined.)
- "Lea Speedmeter." (With odometer combined.)
- National Speed Indicator, 147 Columbus Ave., Boston, Mass. "National."
- Recometre Co. of America, 2120 Broadway, "Recometre."
- Reliance Speedmeter Co., 134 Eliot St., Boston, Mass. "Reliance."
- Smith, R. H. Mfg. Co., The, Springfield, Mass. "Springfield Motometers."
- Standard Thermometer Co., 65 Shirley St., Boston, Mass. "Standard."

# Frost Gear & Machine Co.

## JACKSON, MICHIGAN

(The American Distributing Co., Indianapolis, Ind., Exclusive Sales Agents to the Automobile Trade)

### Gearing, Transmissions, Rear Axle Drives and Differentials, Auto and Engine Parts

We have our own Drop Hammer and Hardening Plant, the best machinery money will buy,  
18,000 feet of floor space, and a reputation for turning out nothing but the best grade of work.

# The Warner Auto-Meter

## The Auto-Meter Costs More

The Slogan of Competition may be said to consist practically of the phrase, "It's cheaper than the Warner Auto-Meter."

For the fact is everywhere acknowledged that the Warner Auto-Meter is the aristocrat of speed indicators.

Let us see what merit there is in this cry of cheapness:

Let it be admitted at the start that the Warner Auto-Meter is the highest priced speed indicator made.

No expense whatever is spared in its construction. Accuracy and dependability are the sole aims. It is built with the same care and thoroughness as the finest watch.

Yet the demand of the Warner Auto-Meter has increased so rapidly that our output has been quadrupled within two years. And our factory is the best equipped of its kind in the world.

Now, then can anyone else make **the same quality more cheaply than we?**

Must there not be a reduction in accuracy, in reliability, in quality, to offset the reduction in price? Judge for yourself.

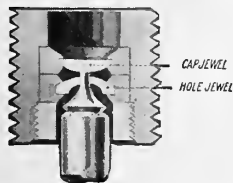
And remember, too, that the Warner Auto-Meter is constructed on the only principle which experience has demonstrated to insure accuracy under all conditions—the principle of magnetic induction.

We should like to send you our booklet, going more into detail.



Model M, \$125

### A Delicate Operation in Warner Auto-Meter Construction—One of Many



**The Jewel Bearings.** The bearings which support the pivot are sapphires, drilled, ground and lapped by jewelers' machinery. They are identical in every way with the pivot jewels used in watches of the highest grade. The hole in the hold-jewels is "olive" shape (so called), the largest and best form of jewel construction. This means that the holes are beveled, being largest at the outside and tapering toward the center, so that while a body of sapphire is used large enough to withstand breakage, the actual bearing surface which comes in contact with the pinion is less than a hair's breadth. The end of the pinion which comes in contact with the cap jewel is rounded, so that the end or

thrust bearing is a mere point. Watchmakers have found that this construction comes so near to eliminating friction entirely that no machine has been devised sensitive enough to measure or indicate the degree of friction which exists.

## Warner Instrument Company

Main Offices and Factory, 818 Wheeler Street, Beloit, Wis.

### BRANCHES

Atlanta, 116 Edgewood Ave.  
Boston, 925 Boylston St.  
Buffalo, 720 Main St.  
Chicago, 2420 Michigan Ave.  
Cincinnati, 807 Main St.

Cleveland, 2062 Euclid Ave.  
Denver, 1518 Broadway  
Detroit, 870 Woodward Ave.  
Indianapolis, 330-331 N. Illinois Street.

Los Angeles, 748 S. Olive St.  
New York, 1902 Broadway.  
Philadelphia, 302 N. Broad St.  
Pittsburg, 5940 Kirkwood St.

San Francisco, 36-38 Van Ness Avenue.  
Seattle, 611 E. Pike St.  
St. Louis, 3923 Olive St.  
(1442)

**SPEED INDICATORS, Auto—Continued**

- Star Speedometer Co., Danville, Pa. "Star."  
Stecker Electric & Machine Co., Detroit, Mich.  
"Oliver."
- ★Stewart & Clark Mfg. Co., 1848-60 Diversey Bldg., Chicago, Ill. "Stewart."
- ★Troy Carriage Sunshade Co., The, Troy, O.  
"Troy."
- Veeder Mfg. Co., Sargeant & Garden Sts., Hartford, Conn. "Veeder." (Tachometer & Tachodometers.)
- ★Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis. "Warner Auto-Meter."

**SPEED INDICATORS, Boat**

- Jones Speedometer, The, Broadway & 76th Sts., N. Y. City. "Jones."
- Nicholson Ship Log Co., Cleveland, Ohio.  
"No. 1 Log." (Speed & distance recording instrument.)
- ★Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis.
- Waterhouse Co., The, 6 Pelham St., Boston, Mass.

**SPEED INDICATORS, Cycle & Motorcycle**

- ★Auto Improvement Co., The, 304 Hudson St., N. Y. City.
- Bullard Specialty Co., Springfield, Mass. "Bullard."
- Jones Speedometer, The, Broadway & 76th Sts., N. Y. City. "Jones."
- Loring Auto Appliance Co., 42 W. 43rd St., N. Y. City.
- Standard Thermometer Co., 65 Shirley St., Boston, Mass.

**SPINNING, Metal**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.
- Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O.
- Goodnow & Blake Mfg. Co., 4th & Porter Sts., Detroit, Mich.
- Goodwin & Kintz Co., Winsted, Conn. (Brass.)
- Turner Brass Works, The, Sycamore, Ill.

**SPLASH APRONS**

(See Dust &amp; Mud Shields.)

**SPOKES, Auto**

- Baltimore Hub-Wheel & Mfg. Co., 326-32 N. Holliday St., Baltimore, Md.
- Breece Mfg. Co., Portsmouth, O.
- Crane & MacMahon, 8-10 Bridge St., N. Y. City. "Hickory Nut."
- Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
- Hagerstown Spoke & Bending Co., Hagerstown, Md. (Wood.)
- Standard Co., The, Torrington, Conn. (Wire.)
- Toledo Carriage Woodwork Co., The, Toledo, Ohio. "Toledo C. W. W. Co."
- Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn. (Wood.)

**SPOKES, Wire, Cycle**

- ★Excelsior Supply Co., 233-37 Randolph St., Chicago, Ill. "Perfection."
- ★Standard Co., The, Torrington, Conn. (Also nipples.)

**SPONGES**

(See Canopies &amp; Sponges.)

**SPRAY HOODS & SPRAY GUARDS**

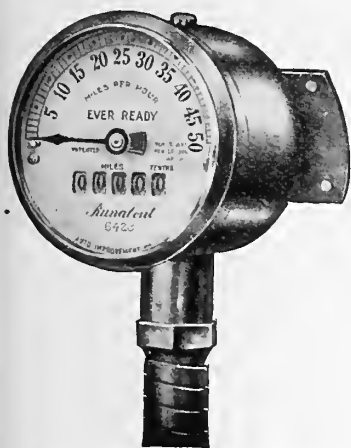
(See Canopies &amp; Spray Guards.)

**SPRINGS, Cushion**

- Barber Mfg. Co., Anderson, Ind. "Cardinal."
- Cleveland Wire Spring Co., Cleveland, O.
- D'Arcy Spring Co., 115 Main St., Kalamazoo, Mich. "Century."
- Dean, Henry E. & Co., 180 Austin St., Worcester, Mass.
- Detroit Wire Spring Co., 21st & Standish Sts., Detroit, Mich. "Royal Arch," "Premier Woven Top" & "Flat Base."
- Foster Bros. Mfg. Co., Utica, N. Y. "Ideal."
- Gibson, Wm. D. Co., Huron & Kingsbury Sts., Chicago, Ill.
- Jackson Cushion Spring Co., Jackson, Mich. "Rough Rider." (Coil.)
- Kelley, E. & Co., 509 Main St., Worcester, Mass. "Union."
- Lounsbury, G. H. & Sons, 107-109 W. 3rd St., Cincinnati, O. (Also back springs, imported.)
- ★National Spring & Wire Co., Albion, Mich. "Black Velvet."
- Radermacher, John L., 16 Horatio St., N. Y. City. "Radermacher's." (Patent edge.)
- Staples & Hanford Co., Newburgh, N. Y.
- Trenton Spring Mattress Co., Trenton, N. J. "Excelsior" & "Lace Web."
- Wing, The Chas. Co., Amesbury, Mass.

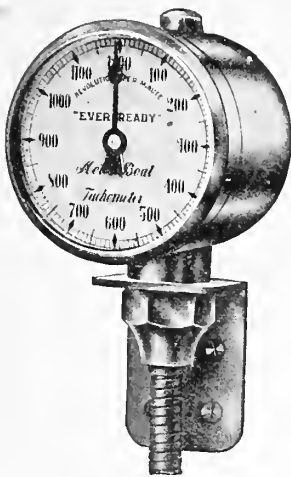
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# "EVER READY"

SPEEDOMETERS for { Automobiles  
Motor CyclesTACHOMETERS for { Motor Boats  
Aeroplanesare the best in the world, regardless of price. 16 separate and distinct styles, **\$15.00 to \$50.00.**

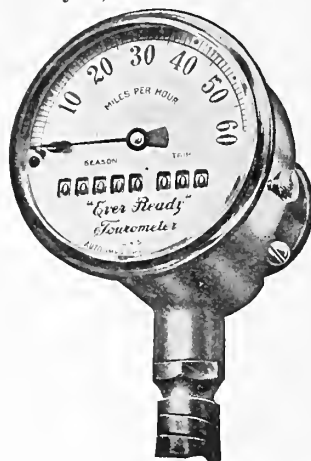
**"Ever Ready" Runabout,**  
**\$15.00**

50 or 80 mile. 2.5-8 inch dial. 10,000  
mile season odometer.



**"Ever Ready" Tachometer,**  
**\$20.00**

Gives the correct revolutions of  
the engine



**"Ever Ready" Tourometer,**  
**\$25.00**

with or without maximum hood  
60 mile. 3 inch dial. 10,000 mile  
season and 100 mile trip odometer,  
with quick reset. Adjustable dash  
bracket.

Manufacturers, Jobbers and Dealers should write for our Proposition NOW.

**AUTO IMPROVEMENT CO., 304-322 Hudson Street, New York**

## SPRINGS, Leaf

Ansted Spring & Axle Co., Connersville, Ind.  
Armstrong, J. B. Mfg. Co., Flint, Mich.  
Auto Parts Mfg. Co., 1359-79 St. Antoine St.,  
Detroit, Mich.  
Burgess, Chas. Jr., Wenona, Ill. "Burgess."  
Champ Spring Co., 2119 Chouteau Ave., St.  
Louis, Mo.  
Cincinnati & Hammond Spring Co., 909-23  
Summer St., Cincinnati, Ohio.  
★Cleveland-Canton Spring Co., Canton, O. "Al-  
ligator" & "C-C."  
Cooper, Geo. & Co., Cleveland, O.  
Delaney, D. & Son, Liberty & Hamilton Sts.,  
Newark, N. J.  
Detroit Steel Products Co., 91-99 East Fort  
St., Detroit, Mich.  
Fickling & Co., 304-306 W. 49th St., N. Y.  
City. (Relief.)  
Forest City Spring Co., Main Ave. & Centre  
St., Cleveland, O.  
Garden City Spring Works, 20th St. & Sante  
Fe Ry., Chicago, Ill.  
Harrow Spring Co., 745 E. Vine St., Kala-  
mazoo, Mich.  
Harvey Spring Co., Station B, Racine, Wis.  
Hess Spring & Axle Co., Carthage, Ohio.  
"Hess."  
Hess-Pontiac Spring & Axle Co., Pontiac,  
Mich. "H-P."  
Higgins Spring & Axle Co., Racine, Wis.  
Insull, Thomas, 1439 Hutchinson St., Phila.,  
Pa.  
International Engineering Co. of N. J., 1779  
Broadway, N. Y. City. "Lemoine. (Im-  
ported.)"  
Iron City Spring Co., 510 Allegheny Ave.,  
(North side), Pittsburgh, Pa.  
Kalamazoo Spring & Axle Co., Kalamazoo,  
Mich.

Keystone Spring Works, 1301-11 Buttonwood  
St., Phila., Pa.  
Lavalette & Co., Stoddard-Dayton Bldg., N.  
Y. City. "Persan-Beaumont." (Im-  
ported.)  
Lewis Spring & Axle Co., Jackson, Mich.  
★Liggett Spring & Axle Co., Park Bldg., Pitts-  
burg, Pa. "Liggett."  
Merrill, The E. R. Spring Co., 526 W. 28th St.,  
N. Y. City.  
Morgan Spring Co., Worcester, Mass.  
Palmer, Jos., 333 Rutherford Ave., Boston,  
Mass.  
Penn Spring Works, Inc., The, Baldwinsville,  
N. Y.  
★Perfection Spring Co., The, 2414 Superior Ave.,  
N. W., Cleveland, Ohio. "Perfection."  
Rowland, William & Harvey, Frankford,  
Phila., Pa. "W. & H. Rowland."  
Sheldon Axle Co., Wilkes-Barre, Pa. "Shel-  
don," "Anchor" & "Dragon."  
Special Motor Vehicle Co., The, 8th & Broad-  
way, Cincinnati, Ohio. "Shumard's."  
(Front spring outfit for runabouts.)  
Spring Perch Co., 232 John St., Bridgeport,  
Conn. (To order.)  
Stanhope Forge & Machine Works, 27 Stan-  
hope St., Boston, Mass.  
★Supplementary Spiral Spring Co., The, 4524-  
4526 Delmar Ave., St. Louis, Mo. (Com-  
bination leaf & coil.)  
Toops Automobile Hood Co., The, Indiana-  
polis, Ind. "Toops." (Compound spring  
& shock absorber.)  
Triple Action Spring Co., 215-217 E. 21st St.,  
Chicago, Ill. "Triple Action."  
★Tuthill Spring Co., 760 Polk St., Chicago, Ill.  
Universal Auto Spring Co., 8500 Florissant Ave.,  
St. Louis, Mo. "Koehler's Universal." &  
"Koehler's Neverbreak." (Cantilever.)  
Watertown Spring Works, Watertown, N. Y.

★ indicates Advertisers—see Index in back of book.

### SPRINGS, Small

- American Spiral Spring Mfg. Co., 568 Butler St., Pittsburg, Pa. (Machinery springs & engine governor springs.)  
 Barnard Specialty Co., 800 H. W. Hellman Bldg., Los Angeles, Cal. "Barnard." (Top tension springs.)  
 ★Barnes, The Wallace Co., Bristol, Conn. (For valves, clutches, ignition devices, brake bands, levers, controls, etc.)  
 Boyd Steel Spring Co., 305-13 State St., Brooklyn, N. Y. (Machinery.)  
 Bridgeport Chain Co., Bridgeport, Conn. (Machinery springs.)  
 Cary Spring Works, 240-42 W. 29th St., N. Y. City.  
 Chatillon, John & Sons, 85 Cliff St., N. Y. City. (Machinery.)  
 Cleveland Wire Spring Co., Cleveland, Ohio. (Machinery.)  
 Cuyahoga Spring Works, Cleveland, Ohio. (Wire coil.)  
 Dunbar Bros. Co., The, Bristol, Conn.  
 Eureka Spring Co., 347 W. Broadway, N. Y. City.  
 Fischer, Chas., Spring Co., 88-90 Walker St., N. Y. City. (Machinery.)  
 Gardner Mfg. Co., 5637-39 Ohio St., Chicago, Ill.  
 ★Gibson, Wm. D. Co., Huron & Kingsbury Sts., Chicago, Ill. (Valve.)  
 Hebb, Geo. A., 68 William St., Newark, N. J.  
 Hubbard, M. D. Spring Co., Pontiac, Mich.  
 Independent Steel & Wire Co., Kenova, W. Va. (Machinery.)  
 Manross, F. N., Forestville, Conn. (Machinery.)  
 Mattson Rubber Co., 161 Columbus Ave., Lodi, N. J. (Round and flat.)  
 ★Miller & Van Winkle, 18-24 Bridge St., Brooklyn, N. Y. "Eagle."  
 Morgan Spring Co., Worcester, Mass.  
 N. Y. Wire & Spring Co., 586-88 Washington St., Hoboken, N. J. (Motor, machinery, valve & special.)  
 Railway Steel Spring Co., 30 Church St., N. Y. City. (Machinery.)  
 Raymond Mfg. Co., W. Church St., Corry, Pa. (Machinery.)  
 Tuck Mfg. Co., 74 Ames St., Brockton, Mass. "Tuck." (Engine.)  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass.

### SPRING CLIPS

Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.

Seward, The M. & Son Co., Grant St., New Haven, Conn.  
 Union Forging Co., Union, N. Y. (Also spring links, clip yokes & axle grips.)  
 Woodruff, The Walter W. & Sons Co., Mt. Carmel, Conn.

### SPRINGS, Supplementary

(See Shock Absorbers.)

### SPRING FRAME SUSPENSION

Valentine, John, 226 La Salle St., Chicago, Ill. "Tillotson."

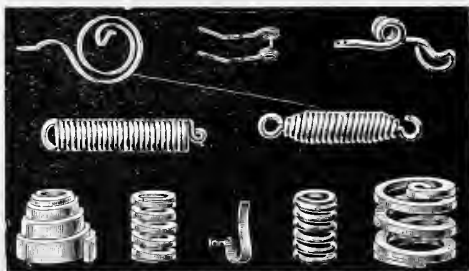
### SPRING REPAIR DEVICES

- ★Auto Spring Repairer Co., 123 Liberty St., N. Y. City. "Auto Spring Repairer."  
 Dayton Auto Top Co., Dayton, O. "Myers."

### SPROCKETS

- ★Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass.  
 ★Boston Gear Works, Norfolk Downs, Mass.  
 ★Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y.  
 Bultman, The F. H. Co., 2108 Superior Ave., N. W., Cleveland, O.  
 Caldwell, W. H. & Son Co., Western Ave., 17th & 18th Sts., Chicago, Ill.  
 Chicago Steel Foundry Company, 19th & Rockwell Sts., Chicago, Ill. (Cast steel, to order.)  
 Collmer Bros., 105 Vistula Ave., South Bend, Ind.  
 ★Cramp, The Wm. & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 ★Cullman Wheel Co., 1340 E. Greenwood Terrace, Chicago, Ill. "Cullman."

## The WM. D. GIBSON CO.



Manufacturers of Springs

Any size, shape or description.  
 Vanadium Valve Springs  
 a Specialty.

**Huron and Kingsbury Sts.  
 Chicago**

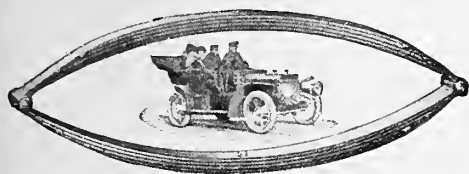
## Makes Cost of Upkeep Small

An automobile must endure terrific strains and shocks known only to motor vehicles.

We have proved that a spring to be strong does not have to be stiff.

By most careful choice of steel and scientific methods of tempering we have succeeded in producing a spring possessed of that rare combination of the strength necessary to withstand the most severe strain and a most remarkable resiliency.

It is this resiliency which makes touring most comfortable and enjoyable. It protects the delicate mechanism of the car and cuts the cost of upkeep in half.



## Cleveland-Canton Automobile Springs

possess in a most remarkable degree a combination of rare tensile strength, elasticity and anti-fatigue properties.

These springs are Heat Treated in Oil—  
not merely flashed in oil or chilled in water.

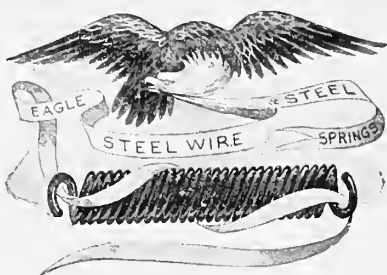
This scientific method of tempering assures a spring full of life, yet so tough that it can be relied upon in the time of severe emergency.

Made in two grades: **Best**—Chrome vanadium. **Next Best**—Special analysis.

### Prompt Shipment Assured

Our new factory has just been completed. Here we will manufacture springs for motor vehicles only. With our improved and increased facilities we positively assure prompt deliveries.

The Cleveland-Canton Spring Company  
Canton, Ohio (7)



## SPRINGS

Tempered

High-Grade Springs of every description. Specially adapted for the Automobile Trade.

*Manufactured by*

**Miller & Van Winkle**

18 to 24 Bridge Street  
Brooklyn, New York



COMPLETE STOCK

## Round and Square 400 Sizes in Stock

SEND US YOUR RUSH ORDERS

ALSO IN STOCK

## Cold-Rolled Brake Band Steel

Cold-rolled sheets and strips for drawing and stamping; thin sheets for shims, liners, etc.

**Edgar T. Ward & Sons**  
23-25 Purchase Street, Boston

**SPROCKETS—Continued**

- ★Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich. "Presteel."
- ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. "Diamond."
- Driggs-Seabury Ordnance Corp., Sharon, Pa.
- Forg, Peter, 50 Park St., Somerville, Mass. "Forg."
- ★Frost Gear & Machine Co., Jackson, Mich. (Rear axle drive gears.)
- Grant Gear Works, Boston, Mass.
- Great Western Mfg. Co., La Porte, Ind. "Fauber." (Cycle, motorcycle & auto.)
- Harris & Reed Mfg. Co., 1500-1518 W. 15th St., Chicago, Ill.
- ★Hydraulic Pressed Steel Co., The, Cleveland, Ohio.
- Meisel Press & Mfg. Co., 944 Dorchester Ave., Boston, Mass.
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. (Cycle.)
- Parish & Bingham Co., 5363 Hamilton Ave., Cleveland, O.
- Philadelphia Gear Works, 1120-22 Vine St., Phila., Pa.
- Reese, S. Machine & Tool Works, 224 W. Main St., Plymouth, Pa.
- ★Sier-Bath Co., 143 W. 54th St., N. Y. City.

**SPROCKET COVERS**

(See Covers, Sprocket.)

**STAMPINGS**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.
- American Tube & Stamping Co., The, Bridgeport, Conn.
- Ashley Machine Works, 714 University Ave., Rochester, N. Y.
- Atlas Stamping Co., 557-61 Jackson Blvd., Chicago, Ill.
- Auto Specialty Co., 85-87 Pearl St., Boston, Mass.
- Avery Stamping Co., Cleveland, O.
- Bay State Screw Co., Hatfield, Mass. (Sheet metal.)
- Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
- Bettcher Mfg. Co., Cleveland, O.
- Bliss, E. C. Mfg. Co., 31 Sabin St., Providence, R. I.
- Bolton, Geo. W., 260 Wreford Ave., Detroit, Mich. (Sheet metal, to order.)
- ★Bowen Mfg. Co., Mechanic St., Auburn, N. Y. (Steel & brass.)
- Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.
- Bronson-Walton Co., Cleveland, O. (Steel.)
- Burr Mfg. Co., 2108 Superior Ave., N. W., Cleveland, O. (Sheet metal.)
- Cassady-Fairbank Mfg. Co., The, 6106-6130 La Salle St., Chicago, Ill.
- Champion Safety Lock Co., Geneva, Ohio. (Sheet metal.)
- Chandler Co., The, 31 Taylor St., Springfield, Mass. (Steel, brass, German silver, aluminum, etc.)
- Chicago Die & Stamping Co., Ravenswood Station, Chicago, Ill.
- Clark, A. N. & Son, Plainfield, Conn.
- Columbia Steel Co., Elyria, Ohio.
- ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.

- Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich.
- ★Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich. "Presteel."
- Eastern Machine & Stamping Co., 115 Wicken-agen St., Providence, R. I.
- Ellis Mfg. Co., Milldale, Conn. (On contract.)
- Emerson, Smith & Co., Ltd., Beaver Falls, Pa. (Steel.)
- Erie Stamping & Mfg. Co., Erie, Pa. "Erie." (Oil reservoirs & special metal stampings of all kinds.)
- Ford Metal Specialty Co., 55 State St., Chicago, Ill. (Brass & steel.)
- Forg, Peter, 50 Park St., Somerville, Mass.
- Forsyth Mfg. Co., 308-11 Terrace, Buffalo, N. Y. (Special, to order.)
- Fort Dearborn Mfg. Co., 1574-80 Crossing St., Chicago, Ill.
- Gasket Supply Co., The, 1729 Ludlow St., Phila., Pa.
- Geuder, Paeschke & Frey Co., St. Paul Ave. & 15th St., Milwaukee, Wis.
- ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, Ohio.
- Grammes, L. F. & Sons, Allentown, Pa.
- Great Western Mfg. Co., La Porte, Ind.
- Hall, Chas. E. Co., 106 Broadway, Buffalo, N. Y.
- Helwig Mfg. Co., St. Paul, Minn.
- Hill, Geo. Q. Co., 326 A St., Boston, Mass.
- Hunt & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O. (Steel.)
- Keeler Brass Co., Grand Rapids, Mich.
- Keyless Lock Co., The, Indianapolis, Ind. (Steel & brass.)
- Konigslow, Otto, Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.
- Lewis Spring & Axle Co., Jackson, Mich.
- Manhattan Screw & Stamping Works, 67th St., & West End Ave., N. Y. City.
- Marbach, The F. G. Co., Medina, Ohio.
- Matthews Mfg. Co., 104 Gold St., Worcester, Mass.
- Matthews, The H. A. Mfg. Co., Seymour, Conn. (Steel or brass.)
- Mayer, Charles W. & Co., 10 Furnace St., Rochester, N. Y.
- Metal Blanks Co., 5407 Euclid Ave., Cleveland, Ohio. (Steel.)
- Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill. (Steel.)
- ★Metal Specialty Co., The, Cincinnati, O.
- ★Metal Stamping Co., 30-50 Hubert St., N. Y. City.
- ★Monroe Electrical Mfg. Co., Monroe, Mich.
- ★Mossberg, Frank Co., Attleboro, Mass.
- Murdock, The James, Jr. Co., 116 Opera Pl., Cincinnati, O.
- Nortmann-Duffke Foundry Co., Layton Ave., 26th to 27th Sts., Milwaukee, Wis. (Steel.)
- Parish & Bingham Co., 5363 Hamilton Ave., Cleveland, O. (Cold pressed steel.)
- Parker, John L. Co., Worcester, Mass.
- Parker White Metal & Machine Co., East 10th St., & Phila. & Erie R. R., Erie, Pa. "Parker." (Parts for pumps, speedometers & odometers.)
- Pendleton Novelty Mfg. Co., Pendleton, Ind.
- Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O.
- Phosphor Bronze Smelting Co., The, Ltd., 2200 Washington Ave., Phila., Pa.
- Ramsdell Specialty Co., West Boylston St., Cor. Eames Rd., Worcester, Mass.
- Reinke & Shirray Mfg. Co., 445-453 Lafayette Blvd., Detroit, Mich. (Sheet metal.)
- Rutter, Arthur T. & Co., 256 Broadway, N. Y. City.
- Savre Stamping Co., Sayre, Pa.
- Schatz Mfg. Co., The, Poughkeepsie, N. Y.
- Smith, M. I., Bristol, Conn.
- Snow, B. W. Co., The, 132 Bissell St., Syracuse, N. Y. (Steel stamping & drawing.)
- ★Sparks-Withington Co., The, Jackson, Mich.
- Standard Metalwork Co., Thompsonville, Conn.
- ★Star Ball Retainer Co., Lancaster, Pa.

★ Indicates Advertisers—see Index in back of book.





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For Diamond, Baldwin  
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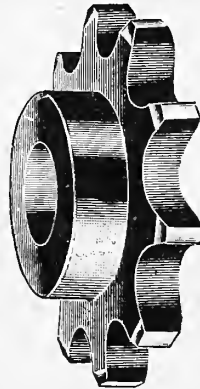
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## STAMPINGS—Continued

- Sterling Machine & Stamping Co., Wellington, Ohio.  
 Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City.  
 Stoll Pressed Steel Co., Buffalo, N. Y. (Steel.)  
 Turner Brass Works, The, Sycamore, Ill.  
 United Bearings Co., Bradford, Pa. (Steel.)  
 U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."  
 ★Walter, N. C. & Sons, 194 William St., N. Y. City.  
 Widman, J. C. & Co., 14th, 15th & Kirby Ave. & G. T. Ry., Detroit, Mich.  
 Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass.

## STANDS, Cycle

- Adams, Henry T. Co., 6823 South Chicago Ave., Chicago, Ill. "Quick Action." (Motorcycle.)  
 Capitol Specialty Works, 467 Madison Ave., Albany, N. Y. (And luggage carriers combined.)  
 ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Excelsior." (Motorcycle stand & luggage carrier.)  
 Goddard, R. W. Co., 15 Abbott St., Worcester, Mass. (Motorcycle.)  
 ★Hendee Mfg. Co., 837 State St., Springfield, Mass. "Indian." (Motorcycle.)  
 Majestic Mfg. Co., Worcester, Mass. "Majestic." (Motorcycle.)  
 Menominee Electric Mfg. Co., Menominee, Mich.  
 Motorcycle Specialty Co., The, 258 Columbus Ave., Boston, Mass. (Motorcycle; also combined with luggage carrier.)  
 Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. (Motorcycle.)  
 Swensen, B. A., 298 Blackstone St., cor. Prairie Ave., Providence, R. I. "Swenson." (Motorcycle.)  
 Widmayer, F. B. Co., 2312 Broadway, N. Y. City. "Widmayer's" (combined motorcycle stand & luggage carrier.)

## STARTERS, Engine

(See Engine Starters.)

## STEAM AUTOMOBILE MOTORS

- Detroit Steam Engine Co., 15 Gilman St., Detroit, Mich. "MacLachlan." (Compound.)  
 Dieter Steam Engine Co., 123 Liberty St., N. Y. City. "Dieter."  
 Jay, Webb Motor Co., 2300 Wabash Ave., Chicago, Ill.  
 Mason Regulator Co., 158 Summer St., Boston, Mass.  
 Michigan Steam Motor Co., Pike & Garland Sts., Pontiac, Mich.  
 Ofeldt, August & Son, 123 Liberty St., N. Y. City.  
 Ofeldt, F. W. & Son, Nyack, N. Y.

## STEAM BOILERS

(See Boilers.)

## STEAM CONDENSERS

(See Condensers, Steam.)

## STEAM MOTOR FITTINGS

- Ashton Valve Co., 271 Franklin St., Boston, Mass. "Ashton."  
 Locke Regulator Co., Salem, Mass.  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 Powell, Wm. Co., 2521-2531 Spring Grove Ave., Cincinnati, O. "Titan" & "Giant." (Indicator throttle valve.)

## STEAM PUMPS

(See Pumps, Steam.)

## STEEL

(See Raw Material.)

## STEEL, Aluminum Coated

(See Aluminum Sheets & Rods.)

## STEEL CASTINGS

(See Castings, Steel.)

## STEERING APPARATUS, Automobile

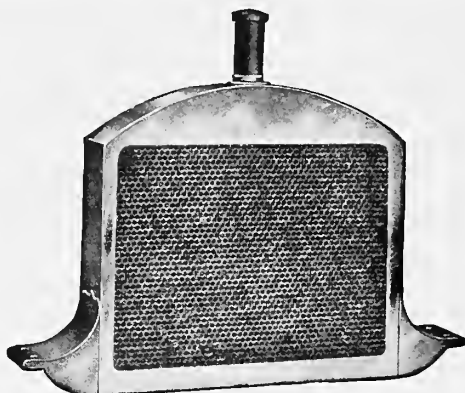
- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 American Gear & Mfg. Co., Jackson, Mich.  
 Auto Parts Mfg. Co., South Elliott St., T. E. W. R., Muncie, Ind. "B. T. K."  
 Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.  
 Baker Gear Co., Homer, N. Y.  
 ★Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass. "Brown's."  
 ★Barnes Gear Co., Oswego, N. Y. "Barnes."  
 Bayard, M. L. & Co., Woodbine, N. J. "Hindley."  
 Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. "B. & S." (Steering connections.)  
 Blood Bros. Machine Co., 633 West Ransom St., Kalamazoo, Mich. "Blood."  
 ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.  
 ★Boston Gear Works, Norfolk Downs, Mass.  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 ★Brown-Lipe Gear Co., 208 S. Geddes St., Syracuse, N. Y. "Brown-Lipe."  
 Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich.  
 Bultman, F. H. Co., The, 2108 Superior Ave., N. W., Cleveland, O. "Bultman."  
 Columbus Screw & Machine Co., The, 244 Kaiser St., Columbus, O. "Columbus" & "Foster." (Truck.)  
 Conestoga Bending Works, 547-49 N. Market St., Lancaster, Pa. (Reaches.)

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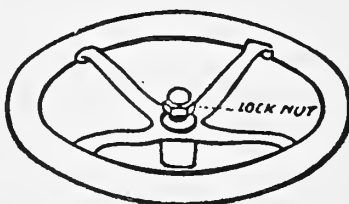
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510 Majestic Bldg.,  
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59 Franklin St.,  
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**STEERING APPARATUS, Automobile—  
Continued**

- Cross Gear & Engine Co., 800-806 Bellevue Ave., Detroit, Mich.  
 Davis, W. J. & Co., 716 10th Ave., N. Y. City. (Sockets.)  
 Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich. (Columns.)  
 Elyria Machine Parts Co., Elyria, O.  
 Ganschow, Wm. Co., Washington Blvd., & Morgan St., Chicago, Ill.  
 ★Gemmer Mfg. Co., 741-747 Merrick Ave., Detroit, Mich. "Gemmer."  
 ★Grant-Lees Machine Co., 6901 Quincy Ave., Cleveland, O.  
 Gunderson-Walter Co., The, 182-94 Bellevue Ave., Detroit, Mich.  
 Greenhagh Engine & Machine Works, 550 & 552 Central Ave., Newark, N. J. "Davis." (Steering ball sockets.)  
 Indiana Auto Parts Co., Marion, Ind. (Gears.)  
 Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.  
 Keim, John R. Mills, Inc., Kensington Ave. & Erie Tracks, Buffalo, N. Y. (Columns.)  
 Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City. "M. & B." (Imported.)  
 ★Long Arm System Co., E. 38th St., & Lakeside Ave., Cleveland, O. (Steering columns.)  
 Meisel Press & Mfg. Co., 944-48 Dorchester Ave., Boston Mass.  
 Morse, Williams & Co., S. W. Cor. 12th & Sansom Sts., Phila., Pa.  
 Motor Car Specialty Co., Lamberton & Lalor Sts., Trenton, N. J.  
 Murray Machine Works, Winchester & Wabansia Aves., Chicago, Ill.  
 Neustadt Auto & Supply Co., 2948-50 Olive St., St. Louis, Mo.  
 ★Ohio Brass Co., Mansfield, O. (To order.)  
 Puritan Machine Co., 72-74 Brush St., E., Detroit, Mich. "Puritan." (Gears & posts.)  
 Queen Mfg. Co., Webster City, Iowa. "B & L." (Trailing spindle.)  
 Ross Gear & Tool Co., Main & 9th Sts., La Fayette, Ind. "Ross."  
 Roth, B. Tool Works, 2122-28 Choteau Ave., St. Louis, Mo. "Simplex."  
 Schweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich. "S. & W." (Also reaches.)  
 ★Smith, A. O. Co., Park, Clinton & Virginia Sts., Milwaukee, Wis. (Columns.)  
 ★Spacke, F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.  
 Wabash Gear Works, Terre Haute, Ind.  
 ★Warner, T. W. Co., Muncie, Ind.  
 ★Warner Gear Co., Muncie, Ind. "Warner."  
 ★Warner Mfg. Co., Toledo, O.  
 ★Widmer Machine Works, Inc., 292-94 E. 135th St., N. Y. City. "Little Giant" & "Bug-yabout." (For light cars.)

**STEERING APPARATUS, Boat**

- Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y. "Columbian." (Rudders, struts & cut-waters.)  
 ★Gray-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.  
 Lamont & Steers Engine Co., Stegmeyer's Boat Harbor, rear 1470 Jefferson Ave., E., Detroit, Mich.  
 Lindley, W. H. Co., Main & Canal Sts., Canastota, N. Y. "Seamans." (Chain steerers.)

**STEERING CHECKS**

- Addison, The, 20-22 S. Hoyne Ave., Chicago, Ill. "Addison."

**STEERING GEAR ATTACH-  
MENTS**

- Auto Steering Co., Hillside, Ill. "Badger Steersman." (Automatic steering device.)

**STEERING KNUCKLES**

- Bates Forge Co., The, Indianapolis, Ind.  
 Chicago Steel Foundry Co., 19th & Rockwell Sts., Chicago, Ill. (Cast steel, to order.)  
 Cincinnati Ball Crank Co., 1644-46 Central Ave., Cincinnati, O.  
 ★Gill, P. H. & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.

**STEERING KNUCKLE BOOTS**

(See Grease Bags.)

**STEERING LEVERS**

(See Levers, Steering.)

**STEERING RODS**

- ★Standard Welding Co., 76th St., N. W., & L. S. & M. S. R. R., Cleveland, O.

**STEERING WHEELS, Automobile**

- Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 ★Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y. "Centaur."  
 Coleman, J. C., 58-60 First St., Detroit, Mich.  
 ★Cramp, The William & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.  
 Detroit Motor Castings Co., 299-303 Beaufait Ave., Detroit, Mich.  
 Detroit Steering Wheel & Wind Shield Co., 274-288 Wight St., Detroit, Mich. "Detroit."  
 Meyer, Morris F., Port Huron, Mich.  
 Prosser Engineering Co., 2110 Superior Viaduct, Cleveland, O.  
 Rastetter, L. & Sons, Ft. Wayne, Ind.  
 ★Standard Welding Co., The, 76th St., N. W., & L. S. & M. S. R. R., Cleveland, O.  
 U. S. Aluminum Castings Co., Vandalia Ave., Cincinnati, O.  
 Wayne Cabinet Co., Detroit, Mich.  
 Westchester Appliance Co., 13-15 Canal Place, Bronx, N. Y. City. "Westchester Rubber Covered."

**STEERING WHEELS, Boat**

- Barnes Tool Co., The, New Haven, Conn. "Barnes."  
 Coleman, J. C., 58-60 First St., Detroit, Mich.  
 Hanksraft Company, 1220 Michigan Ave., Chicago, Ill. "Hanksraft."  
 Turner Brass Works, The, Sycamore, Ill.

## STEERING WHEEL RIMS

American Veneer Co., 100 Market St., Kenilworth, N. J.  
 Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn. (Wooden.)  
 ★Diamond Rubber Co., Akron, O. "Diamond." (Hard rubber.)  
 Kundtz, Theodore, Cleveland, O. "Kundtz."  
 Steering Wheel Co., Sidney, O.  
 Tucker Wood Work Co., Sidney, Ohio. "Tucker."

## STEERING YOKES

Cramp, The William & Sons, S. & E. B. Co., Beach & Ball Sts., Phila., Pa.

## STEPS, Automobile

Blakeslee Forging Co., Plantsville, Conn.  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "Panel." (Rubber covered.)  
 Druen, B. D., New Haven, Conn.  
 Konigslow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
 ★Motor Parts Co., Plainfield, N. J. "Motart Stanwood." (Stamped steel.)  
 Murdock-Shaw Co., 125 Federal St., Boston, Mass.  
 Parish & Bingham Co., 5363 Hamilton Ave., Cleveland, O.  
 Rubber Step Mfg. Co., Exeter, N. H. (Rubber covered.)

## STEP BRACKETS

Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.

## STEP GUARDS

Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O.

## STEP HANGERS

Bossert Co., The, Utica, N. Y. (To order.)  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.

## STEP PLATES

Chicago Steel & Brass Works, 1121-23 Washington Blvd., Chicago, Ill.

## STEP TREADS

New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J. (Rubber.)  
 New York Belting & Packing Co., 91 Chambers St., N. Y. City.

## STORAGE BATTERIES, Vehicle Propulsion

(See Batteries, Vehicle.)

## STORAGE BATTERY SOLUTION

(See Battery Acid.)

## STORAGE BATTERY SUPPLIES

(See also Battery Acid & Battery Jars.)  
 Electrical Maintenance & Repair Co., 200-202 Market St., Newark, N. J. (Repair plates.)  
 Luzerne Rubber Co., Trenton, N. J. (Hard rubber battery cells, covers & vent plugs.)  
 ★Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City. (Lead burning outfits, separators, plates, sealing composition & acid-proof paint.)  
 Waterbury Battery Co., Waterbury, Conn.  
 Westinghouse Storage Battery Co., Boonton, N. J. ("Westinghouse" & "Bijur" battery supplies & "Plante" & "Bijur" positive plates for vehicle batteries.)  
 Witherbee Igniter Co., Springfield, Mass.

## STORAGE IGNITION BATTERIES

(See Batteries, Ignition; Storage.)

## STORM APRONS

Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa.  
 ★Buob & Scheu, 1408-10 Gilbert Ave., Cincinnati, O.  
 Columbia Auto Top Co., 17 Dwight St., Springfield, Mass.  
 Delmar Auto Body & Wheel Co., Indianapolis, Ind. (Rubber.)  
 Diamond Auto Top Construction Co., 220 W. 48th St., N. Y. City.  
 Enterprise Brass & Plating Co., The, Cincinnati, O. "Monarch."  
 Fairfield Rubber Co., The, Fairfield, Conn.  
 Gates-Osborne Mfg. Co., Marshalltown, Ia.  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 Hawes Storm Front Co., 25 N. Hanchett St., Coldwater, Mich. "Hawes."  
 Indiana Top & Vehicle Co., Lawrenceburg, Ind.  
 Irvin, R. J. Mfg. Co., 216-22 W. McCarty St., Indianapolis, Ind.  
 Kroh, C. Z. Mfg. Co., 1212-1214 Jackson St., Toledo, O. "Kroh."  
 Morris, R. Milton, 516-518 W. Baltimore St., Baltimore, Md.  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."  
 Phelps, F. Z. Auto Top & Trimming Co., 1292 Niagara St., Buffalo, N. Y.  
 Quinby, J. M. & Co., 21-39 Division St., Newark, N. J.  
 Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis.  
 Rex Shield & Mfg. Co., Connersville, Ind. "Rex."  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O.

**STRAINERS, Gasoline**

- ★Breeze Carburetor Co., 240 South St., Newark, N. J. "Breeze."
- Carter Carburetor Co., 914-18 N. Market St., St. Louis, Mo. "Carter."
- Central Brass & Fixture Co., The, Springfield, Ohio. "Puritan." (Auto & motor boat.)
- Denver Auto Goods Co., The, Denver, Colo. D. A. G."
- Eastern Power Truck Co., Providence, R. I.
- Fries & Co., 91 Main St., Buffalo, N. Y.
- Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y. "Gem."
- Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Breeze." (Filter funnel.)
- Goblet-Dolan Co., 30 Old Slip, N. Y. City. "C-Yacht."
- ★Gray-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.
- Grubb, Chas. Edmund, 819 Fourth Ave., Altoona, Pa.
- ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich. "Hancock."
- ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill. "Imperial."
- Industrial Instrument Co., Foxboro, Mass. "Eclipse." (Oil filters.)
- Kaufmann, Chas., 28 Main St., Oshkosh, Wis.
- Kinsey Mfg. Co., Toledo, O.
- Kramer, William J., 246 Van Alst Ave., L. I. City, N. Y. "Kramer."
- ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.
- Lindley Co., W. H., Main & Canal Sts., Canastota, N. Y. "Lindley."
- Lovell, McConnell Mfg. Co., 356 Market St., Newark, N. J. "Boss."
- ★Lunkenheimer Co., The, Cincinnati, O.
- Marvel Carburetor Co., 15½ Virginia St., Indianapolis, Ind. "Marvel."
- No-Shammy Co., The, 5710 Hough Ave., N. E., Cleveland, O. "No-Shammy." (Separator.)
- Reynolds, Harry H., 1205 Monadnock Block, Chicago, Ill. "H. H. R."
- Schoke, Oscar, 1211 Jefferson Ave., Brooklyn, N. Y. "Rasco." (Twin gasoline strainer—auto & motor boat.)
- Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."
- Turner Brass Works, The, Sycamore, Ill. "Martin."
- Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn. "Leavitt."
- U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.
- Wheeler & Schebler, Shelby, Barth & Sanders Sts., Indianapolis, Ind. "Schebler."
- Williams Carburetor Mfg. Co., The, 963 William St., Buffalo, N. Y.

**STRAPS**

- ★Ajax Trunk & Sample Case Co., 91-93 Mercer St., N. Y. City.
- Armstrong & Graham, 126 Jefferson St., Detroit, Mich. (Leather.)
- Carter, Geo. R. Co., Connersville, Ind. (Leather & top.)
- Columbia Auto Top Co., 17 Dwight St., Springfield, Mass. (For luggage carriers.)
- Decker, J. C., Montgomery, Pa.
- Detroit Leather Works, 844 Woodward Ave., Detroit, Mich. (Hood.)
- Feeser, Frank S. Co., 1104 Prospect St., Indianapolis, Ind. "Superior." (Leather top & hood.)

- Gerhab & Ludlain, 305 Cherry St., Phila., Pa.
- Gilbert Mfg. Co., New Haven, Conn. "Gilbert."
- Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass. (Leather.)
- Hager, Chas. & Son, 244-46 East 52nd St., N. Y. City.
- Jewell Belting Co., 53 Trumbull St., Hartford, Conn.
- Lynch Mfg. Co., Madison, Wis.
- National Leather Mfg. Co., Niles, Mich.
- Nelson, A. T. A. Co., 2528 Colerain Ave., Cincinnati, O.
- New York Leather Belting Co., 51 Beckman St., N. Y. City.
- Perkins-Campbell Co., The, 622 Broadway, Cincinnati, O. (Top, crank & hood.)
- Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill. (Leather.)
- Sutherland, The F. L. Co., Detroit, Mich.
- Trommer, Charles H., 461 N. 2nd St., Phila., Pa. (Leather.)
- Tuttle & Clark, Jefferson Ave., near Woodward Ave., Detroit, Mich. (Leather, top.)
- Waban Webbing Co., 16 South St., Boston, Mass. "Bullet Proof" (web straps for hoods, trunks, etc.)
- Wing, The Chas. Co., Amesbury, Mass.
- ★Winship, W. W., 71 Summer St., Boston, Mass. (Hood straps with locks.)
- Wolverine Leather Goods Co., 51-59 Fort St., E., Detroit, Mich.

**STUFFING BOXES**

- Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich.
- Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y. "Columbian."
- ★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich. "Essex."
- Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."
- Mechanical Devices Co., Inc., Watervliet, N. Y. "Indispensable." (Automatic aligning, also metallic shaft log combined with ball stuffing box.)
- ★National Tube Co., Frick Bldg., Pittsburgh, Pa.
- Springfield Motor Co., The, Springfield, Mass.
- Turner Brass Works, The, Sycamore, Ill.

**SUPPLEMENTARY SPRINGS**

(See Shock Absorbers.)

**SWITCHES, Ignition**

- Acme Motor Parts Co., La Fayette, Ind. "Acme."
- American Coil Co., Foxboro, Mass. "American."
- ★Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa. "Atwater-Kent."
- Auto-Lock Plug Co., 31 Nassau St., N. Y. City.
- Ballenger, W. T. Mfg. Co., 513 S. Alabama St., Indianapolis, Ind.
- Britton & Carleton Mfg. Co., 311-12 Caxton Bldg., Cleveland, O. (Lock switches for gasoline & electric autos.)
- Cartridge Coil Co., La Fayette, Ind.
- Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Amco."

### SWITCHES, Ignition—Continued

- Combination Lock Switch Co., The, 406 German-American Bank Bldg., Buffalo, N. Y. "Chex." (Combination lock.)
- Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."
- Couch, S. H. Co., Inc., 156 Purchase St., Boston, Mass. "Puritan."
- Crouse-Hinds Co., 308 W. Jefferson St., Syracuse, N. Y.
- Dayton Electrical Mfg. Co., The, 89 St. Clair St., Dayton, O. "Apple" & "Dayton."
- Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."
- Duplex Coil Co., The, Fond du Lac, Wis. "Duplex."
- Edwards & Co., Inc., 14th & Exterior Sts., N. Y. City.
- Eisner, Harry & Co., 29 Scotia St., Boston, Mass. "Eisner."
- Eldredge Electric Mfg. Co., 3 Post Office Sq., Springfield, Mass.
- Electric Goods Mfg. Co., Canton, Mass. "Perfex."
- Empire Electric Mfg. Co., Plainville, Conn.
- Frey, John W., 722 Main St., Buffalo, N. Y. "Radu." (Lock.)
- ★General Electric Co., Schenectady, N. Y. "G. E."
- Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."
- ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Puck."
- Ideal Switch Co., Inc., Plainville, Conn. "Ideal."
- Jacobson-Brandow Co., 126 Columbus Ave., Pittsfield, Mass. "J & B."
- Knoblock-Heideman Co., The, South Bend, Ind. "Quick Action."
- Kokomo Electric Co., The, Kokomo, Ind. "Kingston."
- Loxit Motor Lock Co., North Tonawanda, N. Y. "Loxit." (Lock.)
- McKibbin, Geo. N., 49 Elmwood Ave., S. Norwalk, Conn. "Maclet," "Little Mac" & "Themac."
- Manhattan Electrical Supply Co., 17 Park Place, N. Y. City. "Manhattan."
- ★Morse, Frank W., 516 Atlantic Ave., Boston, Mass. "Puritan."
- Motsinger Device Mfg. Co., Pendleton, Ind. "Motsinger Faultless."
- National Coil Co., 412 Michigan Ave., East, Lansing, Mich.
- ★New York Coil Co., 338 Pearl St., N. Y. City. (Lock & lever.)
- Nilmelior Electrical Co., 1789 Broadway, N. Y. City. (Imported.)
- Parry, A. N. & Co., Amesbury, Mass.
- ★Pfantsiehl Electrical Laboratory, North Chicago, Ill.
- ★Pittsfield Spark Coil Co., Dalton, Mass. "Pittsfield."
- Radu Surgical Instrument Co., 20 Builders' Exchange, Buffalo, N. Y. "Radu." (Lock.)
- Safety Device Co., 372 S. Illinois St., Indianapolis, Ind. (Locking.)
- Schug Electric Mfg. Co., 320 Jefferson Ave., Detroit, Mich. "Robert."
- ★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal. "Seeley."
- Seidler-Miner Supply Co., 207-11 Jefferson Ave., Detroit, Mich. "Economy."
- ★Siren Co., The, 39-41 Cortlandt St., N. Y. City. "Siren O."
- ★Splitdorf, C. F., 261-265 Walton Ave., N. Y. City. "Splitdorf."
- ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.
- Tritt Electric Co., The, Union City, Ind. "Rapid Fire."
- Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.

- Watres Mfg. Co., 1133 Broadway, N. Y. City.
- Western Electric Co., The, 465 West St., New York, N. Y. (Knife.)
- Widmayer, F. B. Co., 2312 Broadway, N. Y. City. (Motorcycle handle bar.)
- Williams, E. Q., 537 S. Clinton St., Syracuse, N. Y.
- Witherbee Igniter Co., Springfield, Mass. "Wico."
- ★Yale & Towne-Mfg. Co., The, 9 Murray St., N. Y. City. "Yale." (Lock.)

### TACHOMETERS

(See Speed Indicators.)

### TALC OR CHALKS, Tire

- American Lava Co., Chattanooga, Tenn. "Alco."
- American Talc Co., 22-24 Custom House St., Boston, Mass. "Imperial."
- Binney & Smith Co., 81-83 Fulton St., N. Y. City. "Tyreze."
- Doggett, Stanley, 101 Beekman St., N. Y. City. (Soapstone, imported.)
- ★Goodrich, B. F. Co., Akron, O. (Soapstone.)
- Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."
- Nevins, Samuel Co., 109 S. Second St., Phila., Pa.
- North Carolina Talc & Mining Co., Hewitt, N. C. "Mantahalal."
- Peterson, T. J. Co., Security Bldg., Chicago, Ill. "Solvolute." (Soapstone.)
- Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's Royal." (French.)
- Waite Auto Supply Co., 17 Dorrance St., Providence, R. I. "Success."
- Williams, C. K. & Co., Easton, Pa.

### TANDEM ATTACHMENTS, Motorcycle

- Adams, Henry T. Co., 6823 South Chicago Ave., Chicago, Ill. "Quick Action."
- Duck, A. W., 427 15th St., Oakland, Cal. "Duck." (Cushion.)
- ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Excelsior."
- ★Hendee Mfg. Co., 837 State St., Springfield, Mass.
- Mueller, L. J., 6417 Woodland Ave., S. E., Cleveland, O. "Mueller."
- ★Reading Standard Co., Reading, Pa. "R-S."

### TANKS, Fuel or Water

- A-Z Co., 527-29 W. 56th St., N. Y. City. "A-Z."
- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.
- Aepinus-Haggstrom Mfg. Co., 1502 Michigan Ave., Chicago, Ill. (Auto & motorcycle.)
- American Steel Barrel Co., 204-206 Varet St., Brooklyn, N. Y. (Motorboat.)
- American Steel Package Co., Defiance, Ohio. "Defiance." (Steel.)
- Auto Radiator Repair Co., 1317 Vine St., Phila., Pa. (Auto; also motorcycle gas & oil tanks.)
- Auto Re-Building Co., 1307-09 Wabash Ave., Chicago, Ill. "Arco."



### TANKS, Fuel or Water—Continued

- Auto Sheet Metal Works, 2228 Michigan Ave., Chicago, Ill.  
 Avery Stamping Co., The, Cleveland, Ohio. "Never-Break." (Pressed Steel.)  
 Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass.  
 Berger Mfg. Co., Canton, O. (Gasoline.)  
 Briscoe Mfg. Co., 1427 Woodward Ave., Detroit, Mich.  
 Bush Mfg. Co., 81 Commercial St., Hartford, Conn. "Bush."  
 Chicago Motorcycle Works, 732 Sheridan Rd., Chicago, Ill. (Motorcycle, to order.)  
 Clayton's, Frank B. Sons, 1222-24 Race St., Phila., Pa.  
 Cleveland Wire Spring Co., Cleveland, O.  
 Columbus Auto Brass Co., The, 181 W. Maple St., Columbus, O.  
 Curtiss Co., 20 Fulton St., N. Y. City. (For boats.)  
 Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich. (Gasoline.)  
 Durlach, I., 54 Vesey St., N. Y. City. (Water tanks.)  
 ★Fedders Mfg. Works, 57-59 Tonawanda St., Buffalo, N. Y. "Fedders."  
 Folsom, C. G. Mfg. Co., South Bend, Ind.  
 Fore River Ship Building Co., Quincy, Mass. (Sheet, brass & copper.)  
 Gem Mfg. Co., Chelsea Station, Boston, Mass.  
 Geuder, Paeschke & Frey Co., St. Paul Ave. & 15th St., Milwaukee, Wis.  
 Gleason-Peters Air Pump Co., 255-261 Clarkson Ave., Brooklyn, N. Y. "G.-P." (Air storage tanks.)  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O.  
 Goblet-Dolan Co., 30 Old Slip, N. Y. City. "C-Yacht." (For boats.)  
 Hayes Mfg. Co., Maybury Grand Ave., & G. T. Ry., Detroit, Mich.  
 Hunt & Dorman Mfg. Co., 2102-10 Superior Ave., N. E., Cleveland, O. (Gasoline.)  
 Hunt Mfg. Co., Lock Box 37, Newark, N. Y.  
 ★Imperial Brass Mfg. Co., The, 441 S. Jefferson St., Chicago, Ill.  
 ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. ("J. S. & Co." seamless steel; "White" steam car tanks.)  
 Kells, W. J. Mfg. Co., 726-28 Eleventh Ave., N. Y. City. "Kells."  
 Keystone Sheet Metal Co., Ambridge, Pa.  
 Kinsey Mfg. Co., Toledo, O. "Kinwood."  
 Koven, L. O. & Brother, 50 Cliff St., N. Y. City. "Koven."  
 ★Mayo Radiator Co., The, State & Mill River Sts., New Haven, Conn. "Mayo." (Fuel & oil.)  
 Metal Stamping Co., Jackson, Mich.  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 New Britain Sheet Metal Co., New Britain, Conn.  
 Novelty Mfg. Co., Jackson, Mich. "Novelty."  
 Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O.  
 Paragon Auto-Parts Co., The, 1709-11 Broadway, N. Y. City.  
 Pressed Steel Tank Co., West Allis Station, Milwaukee, Wis. (Seamless Steel.)  
 Quinby, J. M. & Co., 21-39 Division St., Newark, N. J. (Fuel & oil.)  
 Reliable Radiator Co., 451 E. 173rd St., N. Y. City.  
 Reliance Auto Parts Mfg. Co., 244-50 W. 49th St., N. Y. City. (Fuel & oil.)  
 Sands, A. B. & Sons Co., 22-24 Vesey St., N. Y. City. (Auto & boat.)  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.  
 Sheet Metal Auto Parts Works, 201 W. 48th St., N. Y. City.  
 ★Standard Welding Co., 76th St., N. W., & L. S. & M. S. R. R., Cleveland, O.  
 Sterling Mfg. Co., 201 W. 48th St., N. Y. City.  
 Trageser, John Steam Copper Works, 447 W. 26th St., New York, N. Y.  
 Vogel, Wm. & Bros., 37 S. 9th St., Brooklyn, N. Y. (Gasoline & oil auxiliary.)  
 Wayne Oil Tank & Pump Co., Ft. Wayne, Ind. "Wayne."  
 ★Western Drop Forge Co., Marion, Ind. (Steel.)  
 Westinghouse Air Brake Co., Pittsburg, Pa. (Compressed air tanks.)  
 Wright Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill. (Gasoline.)

### TANKS, Tire Inflating

(See Tire Inflating Tanks.)

### TANK BUSHINGS

Boston Auto Gage Co., 8 Waltham St., Boston, Mass.

### TANK CARRIERS

Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco."

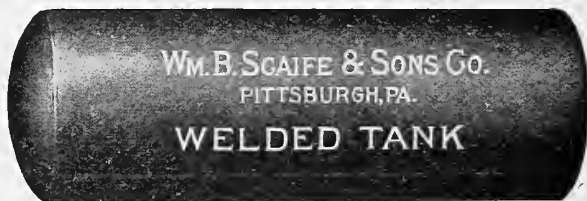
### TANK GAUGES

(See Fuel Level Indicators.)

### TANK KEYS

(See Gas Tank Keys.)

Galvanized or Painted Tanks with Brazed, Riveted or Welded Seams



Air Tanks

Gasoline Storage Tanks

Mufflers

## TANK PLUGS

Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J.

## TAPER PINS

Cassady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.

Chicago Screw Co., 1020-26 Homan Ave., Chicago, Ill.

Cincinnati Screw & Tap Co., Twightwee, O.

★Corbin Screw Corporation, New Britain, Conn.

Detroit Screw Works, Detroit, Mich.

Morse Twist Drill & Machine Co., New Bedford, Mass.

National-Acme Manufacturing Co., The, Cleveland, O.

Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.

Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.

Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich.

★Pratt & Whitney Co., 111 Broadway, N. Y. City.

St. Louis Screw Co., St. Louis, Mo.

Standard Tool Co., Cleveland, O.

Western Automatic Machine Screw Co., Elyria, O.

Worcester Machine Screw Co., Worcester, Mass.

## TARNISH PREVENTIVES

Igniter Appliance Co., 302 Electric Bldg., Cleveland, O. "Ever-Lasting-Lustre."

Schmoeger, F. A., Sterling, Ill. "Stay Shiny."

## TAXIMETERS

★Auto Improvement Co., The, 304 Hudson St., N. Y. City. "Ever Ready."

Breakstone, S., 1712 Michigan Ave., Chicago, Ill. "Lepaute." (Imported.)

Dien, Ch., 45 W. 34th St., N. Y. City.

Franco American Taximeter Co., 735 7th Ave., N. Y. City. "Richard Popp."

General Taximeter Co., 8th Ave. & 49th St., N. Y. City. "Kosmos."

International Taximeter Co. of America, 1974 Broadway, N. Y. City. "International."

Jones Taximeter Co., Speedometer Bldg., Broadway & 76th St., N. Y. City. "Jones."

★Myers, A. J., 244 W. 49th St., N. Y. City. "Seamon & Myers."

Naughton-Mulgrew Taximeter Cab Co., 153-57 East 53rd St., N. Y. City. "Reichert."

## TERMINALS, Wire

(See also Battery Connections.)

American Ever-Ready Co., 304-322 Hudson St., N. Y. City. "Eveready."

Barcy & Nicholson, 967 Howard St., Detroit, Mich. (Copper & brass.)

★Bliss-Chester Co., 31 Mathewson St., Providence, R. I. "Duplex."

Bolton, Geo. W., 260 Wreford Ave., Detroit, Mich. ("Snap-on" spark plug & "Simplex" primary & secondary.)

★Bosch Magneto Co., 223-225 W. 46th St., N. Y. City. "Bosch."

# TANKS

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IN STOCK READY  
SPECIALS TO ORDER



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LITTLE ONES AND  
GREAT BIG ONES



SAFE, SURE, LEAKLESS  
GASOLINE IS DANGEROUS



CHEAP "DON'T CARE" CARS USE  
CHEAP "MAKESHIFT" TANKS

# TANKS

THAT'S ALL

**TERMINALS, Wire—Continued**

- Briggs, W. H., 329 Chestnut St., Richmond Hill, N. Y.  
 Charter & Co., Hoopeston, Ill. "Charter."  
 Connecticut Telephone & Electric Co., 50 Bri-tannia St., Meriden, Conn. "Connecticut."  
 Cooke Hardware Mfg. Co., Hartford, Conn.  
 Electric Motor & Equipment Co., 232 Market St., Newark, N. J.  
 Fahnestock Electric Co., The, 129 Patchen Ave., Brooklyn, N. Y.  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Herz."  
 Luzerne Rubber Co., Trenton, N. J. (Hard rubber.)  
 ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I.  
 ★Morse, Frank W., 516 Atlantic Ave., Boston, Mass. "Morse Eureka" & "Harwood."  
 National Jack & Mfg. Co., 132-134 S. Clinton St., Chicago, Ill.  
 National Steel Products Co., The, Lorain, O. "Cleveland."  
 ★Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss."  
 Noonan Tool & Machine Works, 103½-05 Dominick St., Rome, N. Y.  
 ★Pittsfield Spark Coil Co., Dalton, Mass. "Pittsfield."  
 ★Rajah Auto-Supply Co., Bloomfield, N. J. "Rajah."  
 Read, Henry R., 45 Kingston Ave., Brooklyn, N. Y. "Read."  
 ★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal. "Seeley."  
 Shain, Chas. D., 70 Murray St., N. Y. City. "Shain's."  
 ★Splitdorf, C. F., 261-265 Walton Ave., N. Y. City.  
 Standard Underground Cable Co., Pittsburg, Pa.  
 Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn.

**THERMOSTATS**

(See Boiler Fixtures, Automobile.)

**THREAD**

(See Upholstery Materials.)

**THROTTLE LEVER GRIPS**

(See Grips, Throttle.)

**THROTTLE VALVES**

(See Valves, Miscellaneous.)

**THUMB NUTS**

(See Nuts &amp; Bolts.)

**TIMERS, Ignition**

- Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill. "Acorn."  
 Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.

- Almy Water Tube Boiler Co., Providence, R. I. "Almy."  
 Altemus Mfg. Co., The, 42nd & Chestnut Sts., Phila., Pa. "De Luxe."  
 American Coil Co., Foxboro, Mass. "American."  
 American Electric Fuse Co., Muskegon, Mich. "American Igniter."  
 ★Atwater-Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa. "Kent."  
 Auto & Power Appliance Co., The, 357-359 The Arcade, Cleveland, O.  
 Backe Commutator Co., 33 Herkimer Place, Brooklyn, N. Y. "Backe."  
 Ball-Fintze Co., The, Newark, Ohio. "Avalon."  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Maximus."  
 Benford, E. M., Mt. Vernon, N. Y.  
 Bi-Motor Equipment Co., 177 Portland St., Boston, Mass. "Putnam."  
 Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich. (Marine.)  
 Cameron Electric Mfg. Co., The, Ansonia, Conn.  
 Cartridge Coil Co., La Fayette, Ind.  
 Connecticut Telephone & Electric Co., 50 Bri-tannia St., Meriden, Conn. "Connecticut."  
 Continental Engine Co., Chicago, Ill.  
 Crouse-Hinds Co., 308 W. Jefferson St., Syracuse, N. Y. "Crouse-Hinds."  
 Dayton Electrical Mfg. Co., The, 89 St. Clair St., Dayton, O. "Apple."  
 Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."  
 Duplex Coil Co., The, Fond du Lac, Wis. "D-X."  
 Economic Engine Works, 3 Fulton St., Utica, N. Y.  
 Eisner, Harry & Co., 29 Scotia St., Boston, Mass. "Eisner."  
 Electric Goods Mfg. Co., Canton, Mass. "Per-fex."  
 Enterprise Machine Co., 1114-22 S. Third St., Minneapolis, Minn. "Westman."  
 Fish Systems Co., The, Indianapolis, Ind. "Fish Systems."  
 Harder's Mfg. Co., 40th & Calumet Ave., Chi-cago, Ill. "Phillips."  
 ★Heinze Electric Co., Lowell, Mass. "Heinze."  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Herz."  
 Homer Commutator Co., Cleveland, O.  
 Kneiga Co., Inc., The, Washington, D. C. "Singlespark."  
 Kokomo Mold & Model Works, Kokomo, Ind.  
 Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."  
 Leece-Neville Co., Cleveland, O.  
 ★Lehman, J. H. Mfg. Co., 500 5th Ave., N. Y. City. "Lehman."  
 Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis.  
 Long Bros., Broadway & Buckeye St., Ko-komo, Ind.  
 Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J. "La Coste."  
 M. A. N. Mfg. Co., 257 W. Exchange St., Prov-idence, R. I. "Manco."  
 ★Mechanical & Electrical Mfg. Co., rear 2227 Prairie Ave., Chicago, Ill.  
 Mica Core Mfg. Co., 442 E. 166th St., N. Y. City. "Raves."  
 Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis. "Mil-waukee."  
 ★Mosler, A. R. & Co., 163 W. 29th St., N. Y. City. "Mosler" & "Umph."  
 Motorparts Company, St. Joseph, Mich. "Neverquit" (auto & marine.)  
 Newcomb, A. H., 1944 W. 21st St., Chicago, Ill. "Star."  
 Nihmellor Electrical Co., 1789 Broadway, N. Y. City. (Imported.)

**TIMERS, Ignition—Continued**

- Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J. "Record."  
 Osburn Electric Co., 66 Fort St., E., Detroit, Mich. "Osburn."  
 Oswald Motor Co., Goshen, Ind.  
 Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O. "Perfection."  
 ★Pfanstiehl Electrical Laboratory, North Chicago, Ill.  
 Philadelphia Novelty Supply Co., 2031-33 N. 29th St., Phila., Pa. "P. N. S."  
 Philadelphia Timer & Machine Co., 328 Vine St., Phila., Pa. "Velos."  
 Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill.  
 ★Pittsfield Spark Coil Co., Dalton, Mass. ("Pittsfield"; also Acme" combined timer & distributor.)  
 Quincy Brass Works, The, Inc., 130-34 S. Clinton St., Chicago, Ill. (On contract.)  
 Rochester Timer Co., Livingston Bldg., Rochester, N. Y. "Roch-O."  
 Schug Electric Mfg. Co., 320 Jefferson Ave., Detroit, Mich.  
 ★Seeley Specialties Co., 129 E. 9th St., Los Angeles, Cal. "Seeley."  
 ★Splitdorf, C. F., 261-65 Walton Ave., N. Y. City. "Splitdorf."  
 Threading Needle Co., Minneapolis, Minn. "Darmar."  
 Trio Mfg. Co., 60 Woodbridge St., W., Detroit, Mich. "Trio." (Auto & marine.)  
 Uncas Specialty Co., The, 21-37 Shipping St., Norwich, Conn. "Leavitt."  
 Wachman Auto Mfg. & Supplies, 372 Michigan Ave., Detroit, Mich.  
 Waterhouse Co., The, 6 Pelham St., Boston, Mass. "Bemus."  
 Waterman Marine Motor Co., 1506-1512 Fort St., W., Detroit, Mich.  
 ★Western Motor Co., Logansport, Ind.

Willmarth & Morman Co., 583 Canal St., Grand Rapids, Mich. "Sintz."  
 Witherbee Igniter Co., 1876 Broadway, N. Y. City. "Wico."  
 Zimmerman-Smith Co., The, North Tonawanda, N. Y. "Zimmerman."

**TIMER PARTS**

- American Hard Rubber Co., N. Y. City. (Hard rubber.)  
 Auto Parts Co., 100 Weybosset St., Providence, R. I. "Apco." (Attachments, for Fords.)  
 Bay State Screw Co., Hatfield, Mass.  
 Biederman, C., 1555 Knox St., Cincinnati, O. (Metal.)  
 Delaware Hard Fibre Co., Wilmington, Del. (Hard fibre rings.)  
 Hampden Machine Screw Co., Springfield, Mass.  
 Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.  
 Parker White Metal & Machine Co., East 10th St. & Phila. & Erie R. R., Erie, Pa. "Parker."  
 Standard Fibre Co., Somerville, Mass. (Hard fibre rings.)  
 Stokes, Jos. Rubber Co., Trenton, N. J. (Hard rubber.)  
 ★Van Wagner, E. B. Mfg. Co., Syracuse, N. Y.

**TIPS, Burner**

(See Burner Tips.)

# G & J TIRES

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**N**O other tires on the market can offer a greater margin of safety. No other tires will show as low cost per mile.

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 Kansas City  
 Atlanta  
 Toledo

**G. & J. TIRE CO., INDIANAPOLIS, IND.**

**TIRES, Automobile Cushion**

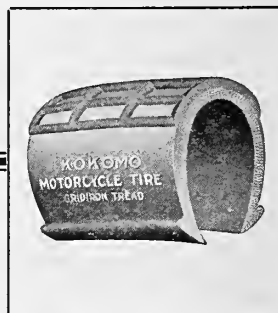
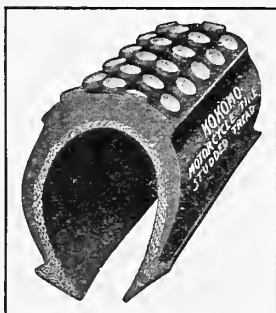
- Airless Tire Co., 806 W. Washington St., Indianapolis, Ind. "National-Airless." (Airless.)
- Brooke Airless Tire, P. O. Box 738, Denver, Col. "Brooke Airless."
- Cleveland Puncture Proof Tire Co., The, 1355 N. High St., Columbus, Ohio. "Cleveland."
- Dayton Rubber Mfg. Co., 1206 Kiser St., Dayton, O. "Dayton" (airless.)
- Motz Clincher Tire & Rubber Co., Akron, O. "Motz."
- St. John Rubber Tire Co., 116 Broad St., N. Y. City.
- Snell, Irving, Little Falls, N. Y. (Double cushioned.)
- Steel Cushion Tire Co., 112 Water St., Boston, Mass. (Steel.)
- ★Swinehart Tire & Rubber Co., Akron, Ohio. "Swinehart" (cushion tires; also cushion spare tires.)
- W.-D. Spring Cushion Tire Co., 107 W. 27th St., N. Y. City. "W.-D." (Spring.)

**TIRES, Pneumatic Automobile**

- Acme Rubber Mfg. Co., E. State St., Trenton, N. J. "Acme."
- ★Ajax-Grieb Rubber Co., 1777 Broadway, N. Y. City. "Ajax."
- American Tire Co., Owosso, Mich. "American."
- Automobile Tire Co., Inc., 1625 Broadway, N. Y. City. "National."
- Balley, C. J. & Co., 22 Boylston St., Boston, Mass. "Bailey" & "Won't Slip." (Licensors.)

Batavia Rubber Co., Batavia, N. Y. "Security Tread."

- ★Boston Tire & Rubber Co., 184 Friend St., Boston, Mass. "Challenge" & "Climax."
- Bowden, Walter, 1619 Metropolitan Ave., Middle Village, L. I., N. Y. "Bowden."
- Calmon Asbestos & Rubber Works of America, 1693 Broadway, N. Y. City. "Calmon's."
- Cincinnati Rubber Tire Co., The, 522 Main St., Cincinnati, O. "Cincinnati."
- ★Consolidated Rubber Tire Co., 20 Vesey St., New York, N. Y. "Kelley Springfield."
- Continental Caoutchouc Co., 1788-90 Broadway, N. Y. City. "Continental."
- Continental Rubber Works, Erie, Pa.
- Cooper, Dr. T. J., 114 Water St., Paterson, N. J. "Fear-Naught." (Punctureless & non-collapsible.)
- Courtney Rubber Co., 1976 Broadway, N. Y. City. "Courtney."
- Cryder & Co., 583 Park Ave., N. Y. City. "Kempshall." (Sole U. S. Agents.)
- ★Diamond Rubber Co., Akron, O. "Diamond."
- Dow Tire Co., 2000 Broadway, N. Y. City.
- Duquet, Louis G., 107 W. 36th St., N. Y. City. "Englebert." (Imported.)
- Elder Mfg. Co., Indianapolis, Ind. "Elder." (Punctureless.)
- ★Empire Tire Co., Trenton, N. J. "Empire."
- ★Falls Rubber Co., The, Akron, O. "Falls."
- Federal Rubber Co., 126 Oneida St., Milwaukee, Wis.
- ★Firestone Tire & Rubber Co., Akron, Ohio. "Firestone."
- ★Fisk Rubber Co., Chicopee Falls, Mass. (Bolted on, standard clincher & quick detachable.)
- ★G & J Tire Co., Indianapolis, Ind. "G & J."
- ★Goodrich, B. F. Co., Akron, O. "Goodrich."
- ★Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear."



**Kokomo Tires. The Kind  
that Does the Business**

**KOKOMO RUBBER COMPANY**

KOKOMO, IND.,

-

-

U. S. A.

# Automobile Tires

## Clincher and Quick Detachable

All New Goods, all High Grade Makes. Small Ad, Small Prices. Money Refunded at once if dissatisfied on receipt of goods. We are not going to tell you that we have contracts with Factories, for they are well able to sell their goods themselves. Our PRICES do the talking. Your money refunded, provided you do not use the goods. Before buying elsewhere let us give you expert information on tires. We are in the business 15 years. Even if you don't buy from us we will be glad to correspond with you. Will give you the best of our advice.

	Shoe	Tube
28 x 2 $\frac{1}{2}$	\$ 6.50	\$2.00
30 x 2 $\frac{1}{2}$	6.00	2.00
28 x 3	9.50	2.25
30 x 3	10.00	2.50
34 x 3	8.00	2.00
36 x 3	10.00	2.00
30 x 3 $\frac{1}{2}$	13.00	3.00
32 x 3 $\frac{1}{2}$	14.00	3.50
34 x 3 $\frac{1}{2}$	14.00	3.50
36 x 3 $\frac{1}{2}$	12.00	3.00
30 x 4	16.50	3.50
32 x 4	17.00	3.75
34 x 4	19.00	4.00
36 x 4	17.00	3.50
32 x 4 $\frac{1}{2}$	15.00	3.50
34 x 4 $\frac{1}{2}$	19.00	4.00
36 x 4 $\frac{1}{2}$	19.00	3.50
34 x 5	18.00	4.00
36 x 5	19.00	4.00

### GOODYEAR, DUNLOP, MICHELIN TYPE

30 x 3 $\frac{1}{2}$	\$15.00
30 x 4	17.00
32 x 3 $\frac{1}{2}$	17.00
34 x 3 $\frac{1}{2}$	17.00
34 x 4	19.00
32 x 4	17.00

Special Tires to fit 30 x 3 Clincher Rims, Brand New Shoe and Tube complete, \$6.50 each.

Mail Orders Especially

**A. H. KASNER**

Near Chambers Street

152 Church Street, N. Y. City

Largest Tire Dealers in U. S.

## Tires!!      Tires!! Tires!!

SOLID AND PNEUMATIC  
for

## Automobiles Carriages Bicycles

Our Stock consists of the most up-to-date and reliable products. We do not handle inferior goods, —which policy is a protection to buyers.

We are in position to handle all kinds of repair work, and are New England Distributors for

### Stein Laplock Tires

and

### Twentieth Century Tire Protectors

(See advertisement page 377)

*Correspondence Solicited*

**Boston**  
**Tire & Rubber Co.**

184 Friend Street

BOSTON, MASS.

**TIRES, Pneumatic, Automobile—Continued**

- Harris Tire & Rubber Co., Broad & Race Sts., Phila., Pa. "Harris." (Fibre tread.)
- Hartford Rubber Works Co., 691 Park St., Hartford, Conn. "Hartford" & "Dunlop."
- Home Tire Co., Trenton, N. J. "Home."
- Hood Rubber Co., 59 Bedford St., Boston, Mass. "Shawmut."
- India Rubber Tire Co., 1461 Michigan Ave., Chicago, Ill. "India Rut Rider."
- Jenatzky Rubber Co., 36 W. 43rd St., N. Y. City. "Jenatzky." (Imported.)
- King Leather Tire Co., 3417-3419 Vliet St., Milwaukee, Wis. "King" (leather.)
- Lee, J. Ellwood Co., Conshohocken, Pa. ("Jelco" wrapped tread & "Paynter" non-skid.)
- McGraw Tire & Rubber Co., Grant Blvd. & 33rd St., Pittsburg, Pa. "Imperial."
- Mansfield Rubber Co., Mansfield, O. "Mansfield."
- Mattson Rubber Co., 161 Columbus Ave., Lodi, N. J.
- Michelin Tire Co., Milltown, N. J. "Michelin."
- Miller Rubber Co., Akron, O.
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M. & W." (Clincher.)
- Murray, A. L., Grand Rapids, Mich. "Murray."
- Newark Rubber Mfg. Co., Newark, N. J.
- New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J. "Carpringco."
- Peerless Tire Co., 1610 Michigan Ave., Chicago, Ill. "Peerless."
- Pennsylvania Rubber Co., Jeannette, Pa. "Pennsylvania." (Clinchers.)
- Preston Fabric Tire Co., 1400-1410 Niagara St., Buffalo, N. Y. "Preston."
- Racine Auto Tire Co., Racine Wis. "Horse-shoe." (Leather.)
- Regent Tire Co., The, 3313-15 Troost Ave., Kansas City, Mo. "Regent." (Leather, also steel studded.)
- Republic Rubber Co., Youngstown, O. "Republic."
- Republic Rubber Tire & Shoe Co., The, 798 10th Ave., N. Y. City. "Hercules." (Leather.)
- Rex Tire Co., 138 W. 68th St., N. Y. City. ("Rex" rubber & leather steel studded, "Samson Rubber," "Samson Type Course" & "Samson Cape Noire" non-skidding leather, imported.)
- Rubber Company of America, 149 Broadway, N. Y. City. "Rubber Co. of America."
- Rubber Step Mfg. Co., Exeter, N. H. "Exeter."
- Rutherford Rubber Co., Rutherford, N. J. "Sterling."
- Shawmut Tire Co., The, Boston, Mass. "Shawmut" & "Meteor."
- Single Tube Automobile & Bl. Tire Co., 42 Broadway, N. Y. City. (Single tube tires for autos & bicycles. Licensors under Tillinghast patents.)
- Star Rubber Co., Akron, O. "Star."
- Stein Double Cushion Tire Co., The, Akron, O. "Stein."
- ★Swinehart Tire & Rubber Co., Akron, Ohio. "Swinehart."
- ★Thermoid Rubber Co., Trenton, N. J. "Nassau," "Triumph" & "Derby."
- Trautman, Ira F., 131 Sixth Ave., Brooklyn, N. Y. "Trautman's."
- United & Globe Rubber Mfg. Co., Trenton, N. J.
- Zeglen Bullet Proof Cloth Co., 1532-34 Michigan Ave., Chicago, Ill. "Zeglen" (puncture proof.)

**TIRES, Solid Automobile**

- Acme Rubber Mfg. Co., E. State St., Trenton, N. J. "Acme." (Side wire.)
- Bowden, Walter, 1619 Metropolitan Ave., Middle Village, L. I., N. Y. "Bowden."
- Brown, Will H., Schofield Bldg., Cleveland, O.
- ★Consolidated Rubber Tire Co., 20 Vesey St., N. Y. City. "Kelly-Springfield." (Sectional.)
- ★Diamond Rubber Co., Akron, Ohio. "Diamond."
- ★Firestone Tire & Rubber Co., Akron, Ohio. "Firestone" (side wire.)
- ★Gibney, J. L. & Bro., 215-17 N. Broad St., Phila., Pa. "Gibney." (Wireless & side-wire.)
- ★Goodrich, B. F. Co., Akron, O. "Goodrich."
- ★Goodyear Tire & Rubber Co., Akron, O. "Goodyear."
- India Rubber Tire Co., 1461 Michigan Ave., Chicago, Ill.
- Miller Rubber Co., Akron, Ohio. (Truck.)
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M. & W."
- Motz Clincher Tire & Rubber Co., Akron, O. "Motz."
- Regent Tire Co., The, 3313-15 Troost Ave., Kansas City, Mo. "Regent."
- Republic Rubber Co., Youngstown, O. "Republic."
- Rutherford Rubber Co., Rutherford, N. J. "Sterling."
- Standard Traction Tread Co., 399 Boylston St., Boston, Mass. "Standard." (Steel tread.)
- Stein Double Cushion Tire Co., The, Akron, Ohio. "Stein."
- ★Swinehart Tire & Rubber Co., Akron, Ohio. "Swinehart."

**TIRES, Special**

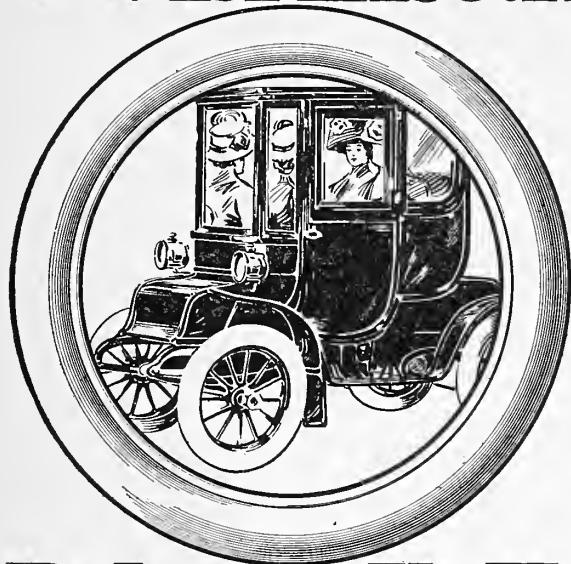
- American Wood Tire Co., 623 Monadnock Block, Chicago, Ill. "American." (Wood, for trucks.)
- Carhart Laminated Tire Co., 2408 Monterey St., San Antonio, Texas. (Fibre board, French flax, compressed & rubber faced.)
- Half-Nelson Tire Co., 1919 Portland Ave., Minneapolis, Minn. "Half-Nelson." (Sectional emergency.)
- McNaull Auto Tire Co., The, 228 Cherry St., Toledo, O. "McNaull."
- National Airless Co., The, Indianapolis, Ind. (Sectional auto.)
- Newmastic Tire Co., 151 W. 68th St., N. Y. City. "Newmastic" (filled.)
- Palmer-Hawkins Rubber Tire Co., 54 Fay St., Akron, O. (The H. A. Palmer sectional truck tire.)

**TIRES, Cycle & Motorcycle**

- ★Ajax-Grieb Rubber Co., 1777 Broadway, New York, N. Y. "Ajax."
- Bailey & Co., C. J., 22 Boylston St., Boston, Mass. "Won't Slip." (Licensors.)
- ★Boston Tire & Rubber Co., 184 Friend St., Boston, Mass. "Challenge" & "Climax." (Cycle.)
- Brooke Airless Tire, P. O. Box 738, Denver, Col. "Brooke Airless." (Motorcycle.)
- Continental Rubber Works, Erie, Pa.
- ★Diamond Rubber Co., The, Akron, O. "Diamond." (Motorcycle.)



# Best for Electrics



## Why Palmer Web Tires Give greatest Mileage

1. On account of their "receptiveness" and "resiliency" these tires give off the energy consumed in surmounting road obstacles and rolling over inequalities of road surface. Hence, they are faster and at the same time *consume less current* from the batteries per mile of running than any other tires made.
2. Their durability is almost beyond comparison with other pneumatic tires for electrics. There is an adequate cushion of rubber for the tread, giving life and long wear to each tire. Unlike solid tires, they save breakage of battery plates and are easier on machinery and transmission as well as on the passengers.
3. They are Safe, Tough and Lively—the ideal combination for electric vehicles. All these facts have been proved in a series of scientifically conducted tests. They can be verified by any careful investigator.

Palmer Web Tires are handled at all the Goodrich Branches,  
located in the principal cities of the United States.



THE B. F. GOODRICH COMPANY, Akron, Ohio

**TIRES, Cycle & Motorcycle—Continued**

- ★ Empire Tire Co., Trenton, N. J. (Motorcycle.)
- ★ Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "Perfection," "Triumph," "Defiance" & "Famous." (Cycle.)
- Excelsior Tire Co., 1777 Broadway, N. Y. City. (Motorcycle.)
- ★ Falls Rubber Co., The, Akron, O. "Falls."
- ★ Flisk Rubber Co., The, Chicopee Falls, Mass. "Flisk."
- ★ G & J Tire Co., Indianapolis, Ind. "Goodrich," "Palmer," "G & J" & "M & W."
- ★ Goodrich Co., B. F., Akron, O. "Goodrich," "Palmer," "G & J" & "M & W."
- ★ Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear."
- Hartford Rubber Works Co., 691 Park St., Hartford, Conn. "Hartford." (Solid.)
- ★ Indiana Rubber & Insulated Wire Co., Jonesboro, Ind. ("Indiana" cycle & motorcycle, & "Wabash" cycle.)
- ★ Kokomo Rubber Co., Kokomo, Ind. "Kokomo." (Motorcycle.)
- Mayo, James, 222 Penn St., Reading, Pa. "Mayo." (Cycle.)
- Miller Rubber Co., Akron, O. (Motorcycle.)
- ★ Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M & W." (Motorcycle.)
- ★ N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "Peter Union" & "Shamrock Excelsior." (Motorcycle.)
- Pennsylvania Rubber Co., Jeannette, Pa. "Pennsylvania." (Motorcycle.)
- Preston Fabric Tire Co., 1400-1410 Niagara St., Buffalo, N. Y.
- St. John Rubber Tire Co., 116 Broad St., N. Y. City. "St. John." (Cycle, cushioned.)
- Vim Cycle & Hardware Co., 228-230 Broadway, Buffalo, N. Y. "Vim." (Cycle.)

**TIRE ALARMS**

Terpening, E. A., Mokena, Ill. (Electric pneumatic tire signal.)

**TIRE BANDS**

(See Tire Repair Articles, Auto.)

**TIRE BOLTS**

- Atlas Bolt & Screw Co., 1289 Marquette Road, N. E., Cleveland, O. "Atlas."
  - ★ Diamond Rubber Co., Akron, O. "Diamond."
  - Joyce Air Cushion Tire Bolt Co., 52-54 West 67th St., N. Y. City. "Joyce." (Air cushion.)
  - Michelin Tire Co., Milltown, N. J. "Michelin."
  - Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.
  - Russell & Irwin Mfg. Co., 94-98 Lafayette St., N. Y. City.
  - Smith, H. D. & Co., Plantsville, Conn. "S."
  - Western Tool & Forge Co., Brackenridge, Pa.
- TIRE CASES**
- ★ Allen Auto Specialty Co., 1926 Broadway, N. Y. City. "Allen."
  - Automobile Metal Specialty Co., 4430 Market St., Phila., Pa. "Avil." (Steel.)
  - Balzer, Gus, 1777-79 Broadway, N. Y. City. (Metal.)
  - Bohnet, John & Co., 114-116 Grand Ave., S., Lansing, Mich.

# Diamond

## Motor Cycle Tires Are Tough Tires

Made to give easy riding, secure  
Motorcycle Tire efficiency—that  
for which the user pays and  
which is

### What We Sell

*Special Motorcycle Tire  
Booklet on Request*

**The Diamond Rubber Co.**  
AKRON, OHIO



# FISK *Quality* TIRES

**Y**EARs ago, at the beginning of its business, the Fisk Rubber Company laid down a policy which has since been steadfastly adhered to. That policy was to tell the truth about its products.

**W**E might claim to operate the largest automobile tire manufactory in the world—but we do not. We might maintain that we produce more automobile tires than any other concern—but we do not. We might publish broadcast the fact that the Fisk Removable Rim is used on more cars than any other make—but it is not. We might mislead the public into believing that the temporary and ofttime gratuitous tire equipment on cars at automobile shows is a reflection of a permanent choice—but it is not.

**W**E DO CLAIM, and we can prove our statement, to make **THE BEST** tire on the market to-day, barring none. We know the Fisk Removable Rim is the safest, quickest and best obtainable, and the only rim which works equally well in muddy and freezing conditions. Years of high-class manufacturing experience, a knowledge of the materials that go into our products, and comparison with the wearing qualities of other makes, are some of the reasons why we know in stating these facts we tell the truth.

**FISK Quality** Tires are made in four styles—Bolted-On, Clincher, Q. D. Clincher and Dunlop. We have established branches in the principal cities, where the motorist may find at all times a full stock of different sizes and styles and an intelligent repair department in charge of experts.

## The Fisk Rubber Company

**Chicopee Falls, Mass.**

BRANCHES IN SEVENTEEN CITIES

Write Dept. J to learn more about Fisk *Quality*

**TIRE CASES—Continued**

- Cook, E. C. & Bro., 49 E. Kinzie St., Chicago, Ill.
- ★Diamond Rubber Co., Akron, O. "Diamond."
- ★Empire Tire Co., Trenton, N. J. "Empire."
- Excelsior Implement Co., Troy, N. Y. "Excelsior Brand Can't Rip."
- Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.
- ★G & J Tire Co., Indianapolis, Ind. "G & J."
- Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y.
- Gates-Osborne Mfg. Co., Marshalltown, Iowa. "G. O."
- Gilbert Mfg. Co., New Haven, Conn. "Gilbert."
- ★Hopewell Bros., 29 Chapel St., Newton, Mass. "Hopewell" & "Kinder."
- London Auto Supply Co., 2540-48 Wabash Ave., Chicago, Ill.
- ★Merchant & Evans Co., 517 Arch St., Phila., Pa. "Star." (And tool case combined.)
- Murray, Joseph, Newton, Mass. "Ideal."
- Murray, P. A. & Co., Newton, Mass.
- Myers Auto Top Co., The, S. E. cor. First & St. Clair Sts., Dayton, O.
- ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."
- Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill.
- Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. "Glovefit."
- Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis. "The Racine."
- Rex Shield & Mfg. Co., Connerville, Ind. "Rex." (Also tube cases.)
- Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.
- Taylor, C. A., Trunk Works, 35 E. Randolph St., Chicago, Ill.
- ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon" & "Brock."

Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo. "Inner-Lap."

Wiley, The Wm. H. & Son Co., Box 78, Hartford, Conn. "Perfect."

★Winship, W. W., 71 Summer St., Boston, Mass.

**TIRE CEMENT**

(See Cement, Tire Repair.)

**TIRE CHAINS**

(See Anti-Skids.)

**TIRE FILLINGS**

- ★Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. "Neverleak."
- Massachusetts Automobile Co., 52 Church St., Boston, Mass.
- Newmastic Tire Co., 151 W. 68th St., N. Y. City. "Newmastic."

**TIRE HOLDERS**

- (Including Combined Locks & Holders.)
- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.
- ★Allen Auto Specialty Co., 1926 Broadway, N. Y. City. "Allen." (And locks.)

# Season Opening Offer

## ON NEVERLEAK!

### Free! 12 Extra Certificates

**IF** YOU WILL ORDER from your jobber one gross tubes of Neverleak, you will receive, absolutely free, 12 extra certificates in addition to 12 usually packed with that quantity, making 24 certificates in all. The above offer will not be accepted after April 15, 1910. The certificates will apply on any of the following high-class premiums:

10 certificates, French Gold Clock or No. 30 Conklin Pen; 12 certificates, Solid Brass Business Sign; 15 certificates, \$6.00 Conklin Fountain Pen; 20 certificates, 42-Piece Decorated China Dinner Set; 24 certificates, Sessions Regulator Clock, or Success Emery Grinder; 33 certificates, 24-inch Solid Leather Suit Case, or a Hand-carved, Imported Cuckoo Clock; 36 certificates, a 72-Piece Decorated China Dinner Set; 48 certificates, a 20-Year, Gold Filled, Open Face, No. 16 Size, Thin Model, N. Y. Standard Watch; 60 certificates, a 20-Year, Solid Gold Filled, Genuine Elgin Watch; Open Face, 16 Size, 7-Jewel, latest thin model.

**Remember! this offer is not good after April 15, 1910**

## Buffalo Specialty Co., Buffalo, N. Y.



**W**E are often asked by prospective purchasers why the AJAX EXTRA HEAVY NON-SKID tires do not *skid*. We answer: "It's In The Tread."

**I**N creating an absolutely non-skid tire that could be guaranteed for 5000 miles or 200 days' service, the same as all Ajax products, the weak points of other so-called non-skid tires were studied and guarded against.

**T**HE Tread of the Ajax Non-Skid is made of Para Rubber divided into rectangular shaped blocks with beveled edges. This provides suction or holding power under load. The traction and side resistance are there when needed, but do not diminish the easy-riding and long-wearing qualities found in Ajax tires. There are no steel studs to wear smooth and become a skating surface—just rubber, but so shaped that skidding is killed.

**R**EMEMBER—the car equipped with the Ajax Heavy Non-Skid Tires is protected by the same guarantee as all Ajax products—5000 miles or 200 days' service.

The AJAX AIR GAUGE, a new invention, pocket size, nickel finish, showing air pressure at all times, with the table of correct pressure for all size tires engraved on gauge. This simple, efficient instrument is made by A. Schrader's Sons, Inc. The price is \$1.00.

## Ajax-Grieb Rubber Company

**General Offices: 1777 Broadway, New York**

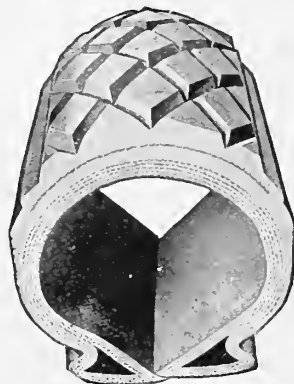
**Factories: Trenton, New Jersey**

### BRANCHES:

**New York, 57th St. and Broadway**

Philadelphia, 316 N. Broad St.  
Boston, 15 Park Square  
Atlanta, 38 Auburn Ave.  
Detroit, 743 Woodward Ave.  
Denver, 1529 Cleveland Place  
Seattle, 917 East Pike St.  
Portland, Ore., 142 Nineteenth St.  
San Francisco, 544 Van Ness Ave.

Los Angeles, 1038 So. Main St.  
Chicago, 1425 Michigan Ave.  
Minneapolis, 905 First Ave., S.  
Kansas City, 1422 Grand Ave.  
Milwaukee Agents, Goodyear Rubber Co.  
St. Louis Agents, Goodyear Rubber Co.



**Tread of Ajax Extra Heavy Non-Skid Tire**

**TIRE HOLDERS—Continued**

- Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.  
 Attwood Brass Works, 18-20 Bowery St., Grand Rapids, Mich.  
 B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, Ohio.  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Monarch." (Adjustable.)  
 Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill. "Amco."  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn.  
 ★Cox Brass Mfg. Co., 234 Thoroughfare Bldg., Albany, N. Y., "Monarch," "Duplex," "Acme," "Model," "Standard" & "Globe."  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 ★Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich.  
 Downing, Chas. J., 1777 Broadway, N. Y. City.  
 "Downing." (Also locks.)  
 Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
 Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill.  
 Gaylord, F. L. Co., 28 Pleasant St., Ansonia, Conn.  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert." (And locks.)  
 Harper, Thos., 139-145 Lafayette St., N. Y. City. "Harp."  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."  
 Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
 Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill.  
 Landon, The John S. Co., 200 N. Main St., Elkhart, Ind. "Landon." (Extra tire holders & locking device.)  
 Lovell-McConnell Mfg. Co., 365 Market St., Newark, N. J.  
 Lund Smith Co., The, 51 Godwin St., Paterson, N. J.  
 M. A. N. Mfg. Co., 257 W. Exchange St., Providence, R. I. "Manco."  
 Machine Accessories & Novelties Mfg. Co., 257 W. Exchange St., Providence, R. I.  
 Medina Machine & Stamping Co., Medina, N. Y.  
 Metallic Specialties Co., 4228 Ludlow St., Phila., Pa.  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City. "Perfection."  
 Meteor Tank Co., Middle Haddam, Conn.  
 Motor Car Equipment Co., The, 55 Warren St., N. Y. City.  
 ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill. "A.B.C."  
 National Jack & Mfg. Co., 132 & 34 S. Clinton St., Chicago, Ill.  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."  
 Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.  
 Philadelphia Novelty Supply Co., 2031-33 N. 29th St., Phila., Pa. "P. N. S."  
 Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson."  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.  
 Riley Bros., Bridgeton, N. J. "Riley."  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. "Aremco."  
 ★Rumpp, C. F. & Sons, 5th & Cherry Sts., Phila., Pa. "Keystone."  
 ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich.  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 Stryker, C. W., 314 E. Onondaga St., Syracuse, N. Y. "Stryker."  
 ★Toffler, S. Co., Inc., 145th St. & Southern Blvd., N. Y. City.  
 Turner Brass Works, The, Sycamore, Ill.  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."

- ★Victor Auto Supply Mfg. Co., 42 W. 43rd St., N. Y. City. "Vasco."  
 Vogel, Wm. & Bros., 37 S. 9th St., Brooklyn, N. Y.  
 Waite Auto Supply Co., 17 Dorrance St., Providence, R. I. "Success."  
 Western Brass Mfg. Works, 21st St. & Campbell Ave., Chicago, Ill.  
 Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal. "Western." (Telescoping.)

**TIRE INFLATORS, Mechanical**

- (See also Pumps, Tire.)  
 Auburn Auto-Pump Co., 1 Mason Lane, Auburn, N. Y. "Ten Eyck."  
 Auto Pump Co., Springville, N. Y. "Spencer."  
 Backe Commutator Co., 33 Herkimer Place, Brooklyn, N. Y. "Backe."  
 Eberman Auto Appliance Co., 1205 Monadnock Block, Chicago, Ill. "Eberman."  
 Fenstermacher, O., 311 S. Fifth St., Minneapolis, Minn. "O.B."  
 H. & C. Tire Inflator Co., 22 North Canal St., Dayton, O. "H. & C."  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "Herz."  
 ★Kellogg Mfg. Co., E. Main & Circle Sts., Rochester, N. Y. "Kellogg."  
 Law, F. A. Machine Co., 41 Wells St., Hartford, Conn. "Maxim."  
 Manzell, Charles W., 89-93 Main St., Buffalo, N. Y. (Engine driven.)  
 Martin & Anson Co., 2226-8 Indiana Ave., Chicago, Ill. (Electric.)  
 ★Nightingale Whistle Mfg. Co., 1777 Broadway, N. Y. City. "Delpeuch."  
 Pacific Tucking & Mfg. Co., 471 18th St., Brooklyn, N. Y. "P.T.C."  
 Rex Tire Co., 138 W. 68th St., N. Y. City. "Pompe Vadam." (Imported.)  
 ★Rohrbacher Automatic Air Pump Co., 173 E. Water St., Portland, Ore. "Rohrbacher."  
 Rung Automatic Tire Pump Co., 200 Franklin Bank Bldg., Phila., Pa. "Rung."  
 Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill.  
 Wheaton & Utley, Sunbury, Ohio. "E-Z."

**TIRE INFLATING TANKS**

- Bishop & Babcock Co., 525 Garfield Bldg., Cleveland, Ohio.  
 ★Goodyear Tire & Rubber Co., Akron, Ohio. "Goodyear." (Air bottle.)  
 Lennox Chemical Co., The, Cleveland, Ohio. "Lennox."  
 Liquid Carbonic Co., 67 Wells St., Chicago, Ill. "Emancipator" & "Portable Baby."  
 New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Universal."  
 ★Prest-O-Lite Co., The, 229-237 E. South St., Indianapolis, Ind. "Prest-O-Lite."  
 Rex Tire Co., 138 W. 68th St., N. Y. City. "Pompe Vadam." (Imported.)  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.  
 Standard Carbonic Co., The, 1946 W. 6th St., Cincinnati, O.

**TIRE IRONS**

(See Tire Tools.)

★ indicates Advertisers—see Index in back of book.



IT IS EZ ON AND EZ OFF

# Nathan's Lock LAP

NEW 1910 STYLE

## Buttoned Tire Cover

Pat. Pending

**SIMPLY**

Adjust snugly about tire  
and button.

## THE LAP LOCKS ITSELF

and makes cover water and dust proof when  
placed on car in any position.

**Mr. Consumer**  
**Mr. Dealer**  
**Mr. Jobber**

We emphasize that we shall MAIN-  
TAIN the QUALITY, MAKE and  
FIT of our well-known line, and our  
1910 PRICES will be the LOW-  
EST. New catalog now ready.

Write for Prices

### NEW LIST FOR 1910

Best Enameled Duck,	All Sizes,	\$2.25 each
Best Enameled Drill,	" "	\$2.10 "
Best Enameled, all colors,	" "	\$2.85 "
Best Fabric Leather, all colors,	" "	\$3.75 "

We also manufacture Lamp Covers, Tire Trunks, Coat Rail  
Bags, Auto Trunks, etc.

## Nathan Novelty Manufacturing Company

Largest Manufacturers of Everything Made of  
Fabric for the Auto

Auto Dept., 84 to 90 Reade Street, New York City



## TIRE LUGS

Breakstone, S., 1712 Michigan Ave., Chicago, Ill. "Edco." (Imported.)  
 Clark Novelty Co., 380 Exchange St., Rochester, N. Y.  
 Cryder & Co., 583 Park Ave., N. Y. City. "Hermatic." (English.)  
 Dien, Ch., 45 W. 34th St., N. Y. City. "Edco." (Imported.)  
 Joyce Air Cushion Tire Bolt Co. 52-54 West 67th St., N. Y. City. "Joyce."  
 Mattson Rubber Co., Lodi, N. J.  
 Nadall-Van Sicklen Mfg. Co., 1339 Michigan Ave., Chicago, Ill. "Nadall."  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."  
 Sterling Machine & Stamping Co., Wellington, O.

## TIRE MASTICS

Michelin Tire Co., Milltown, N. J. "Michelin."

## TIRE PATCHES

(See Tire Repair Articles.)

## TIRE PLUGS

(See Tire Repair Articles.)

## TIRE PRESSURE GAUGES

Barnard Specialty Co., 800 H. W. Hellmann Bldg., Los Angeles, Cal. "Barnard."  
 Brockert & Gerham, Marion, Ohio. "Brogor."  
 Brown Co., The, 1071-73 S. Clinton St., Syracuse, N. Y. "Brown."  
 Codman & Shurtleff, Inc., 126 Boylston St., Boston, Mass.  
 Edelmann E. & Co., 36 La Salle St., Chicago, Ill. "Edelmann."  
 Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. "G-P."  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Industrial Instrument Co., Foxboro, Mass. "Standard."  
 Judd & Leland Mfg. Co., Clifton Springs, N. Y. "Washburn."  
 ★Kellogg Mfg. Co., E. Main & Circle Sts., Rochester, N. Y. "National" & "Kellogg."  
 Michelin Tire Co., Milltown, N. J. "Michelin."  
 Newerf, W. D. Rubber Co., 949 S. Main St., Los Angeles, Cal. "Twitchell."  
 Safety Tire Gauge Co., 1463 Michigan Ave., Chicago, Ill. "Safety." (Combination pump connection & air gauge.)  
 Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill.

## TIRE PROTECTORS

(See also Anti-Skid Devices.)

American Tire Co., Owosso, Mich. "Xtra-Servis," "Protecto," "Triumph" & "Sectional."  
 Atlas Rubber Co., Niagara & Massachusetts Aves., Buffalo, N. Y. "Atlas." (Non-puncture inner cases.)  
 Barrell Pneumatic Tire Protector Co., 16 State St., Boston, Mass.

# Kellogg Pressure Indicator



Pat'd.

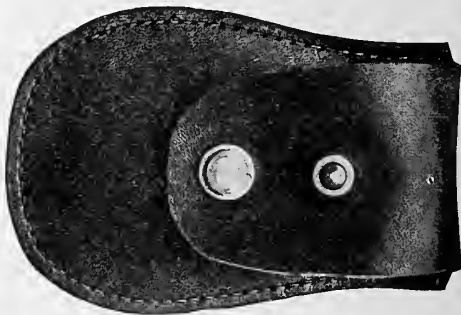
1904

PRICE

\$2.50

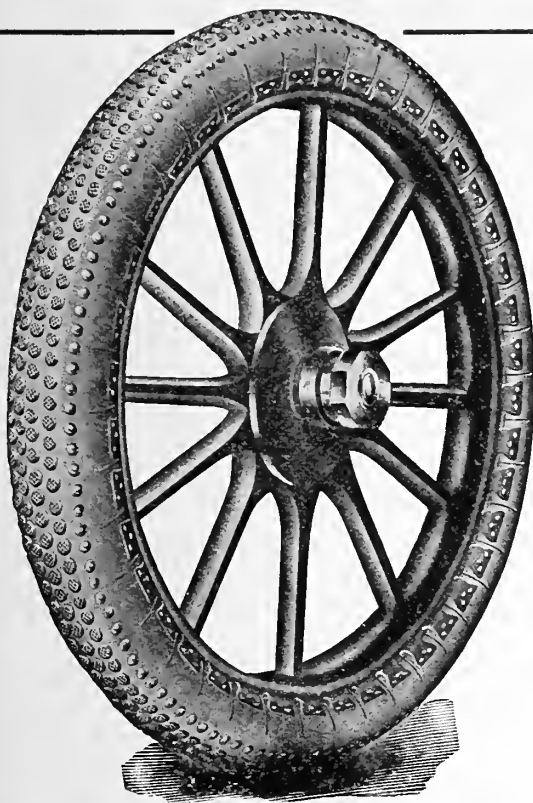
This instrument is a decided improvement over anything in its class for showing pressure in Tires. It is automatic in every particular; easily attached and accuracy guaranteed to be within 2 per cent.

Neatly put up in a Leather Case.



Ask your dealer  
or write

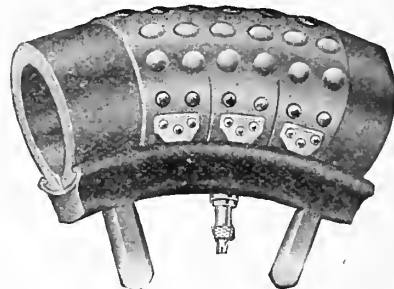
**KELLOGG MANUFACTURING CO.**  
**Rochester, N. Y.**



## 20th Century Tire Protector for Automobile and Motor-Cycle Tires

Are as iron-clad in material and workmanship as the Guarantee under which they are sold:—and this is the **GUARANTEE**; Money refunded, expressage paid both ways, to any reliable party who finds the "20th Century" not as represented. Only the best **IMPORTED LEATHER** is used. It covers rubber tire completely, affording positive protection against water, sand, rocks, ruts, Punctures, Blowouts, Rim-cuts and Skidding. You take, therefore, no chances Mr. "Decker" in handling the 20th Century Tire Protector.

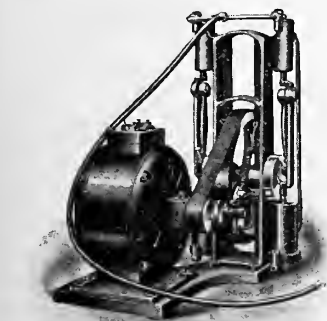
**Our Emergency Patch has no Equal**



**GUARANTEED** to give perfect satisfaction in **EVERY RESPECT**, or money refunded. Send \$2.00 for our 3 in. Emergency Patch, post-paid, and try it. We ship all goods subject to examination before paying for same. Write for Illustrated Catalogue, price-list, and discounts to agents.

**20th Century Tire Protector Company**  
Midlothian, Texas

# Globe Automatic Air Pumps



No. 12 Globe Electric Auto Pump. 4 cylinders, Automatic Double Compound.

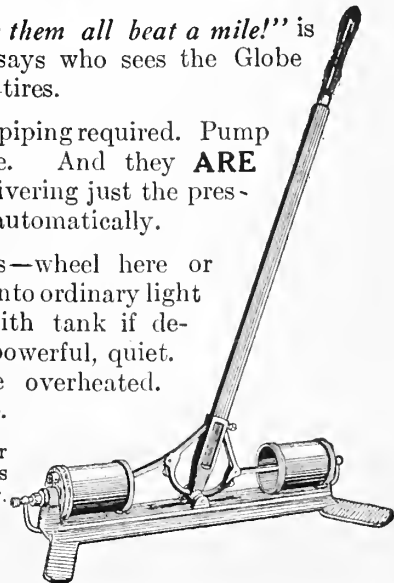
*"You have them all beat a mile!"* is what everyone says who sees the Globe Pump inflating tires.

No tank or piping required. Pump direct into tire. And they **ARE automatic**, delivering just the pressure wanted—automatically.

On casters—wheel here or there and plug into ordinary light socket. Use with tank if desired. Rapid, powerful, quiet. Cannot become overheated. Last a lifetime.

We invite your careful inspection to substantiate our claim that these are the most satisfactory and perfect pumps for Auto service. Sizes and prices to suit every purchaser. Ask for prices and further information.

**Globe Manufacturing Co.**  
Battle Creek, Mich.



No. 18. High Pressure, Easily Operated, Rapid, Lever Pump for Private Garage. Portable.

**TIRE PROTECTORS—Continued**

- ★Bricton Mfg. Co., Brookings, S. Dak. "Bric-ton." (Detachable treads.)
- Brockett & Gorham, Marion, Ohio. "Marion." (Reliner.)
- Caldwell, E. P. Co., 219 E. Fourth St., Water-  
loo, Ia. "Caldwell's." (Steel.)
- Canne, H. L., Milford, Pa. "Canne." (Anti-  
skid steel belt.)
- Case Casing Co., The, Mt. Pleasant, Iowa.  
"Casey Case."
- Continental Rubber Works, Erie, Pa. (Also  
inner tube.)
- Davis Robe Co., The, Inc., 126 S. State St.,  
Chicago, Ill. "Davis." (Steel.)
- Dayton Inner Tire & Mfg. Co., 17 Madison St.,  
Dayton, O. "Dayton." (Inner tire of  
rubberized duck.)
- Detroit Leather Works, 844 Woodward Ave.,  
Detroit, Mich. "Knight." (Anti-skid.)
- ★Diamond Rubber Co., Akron, Ohio. "Dia-  
mond." (Tube protectors.)
- Double Fabric Tire Co., Auburn, Ind. (Inside  
tire re-inforcements & outside shoes.)
- Dykes, John L. & Co., Chicago, Ill. "Never  
Kreep." (Inner shoes.)
- Empire Mfg. Co., 200 E. Exchange St., Ak-  
ron, O.
- ★Empire Tire Co., Trenton, N. J. "Empire."  
Eureka Tire Shield Co., Inc., 36 Manhattan  
St., N. Y. City. "Eureka." (Inner tire  
shield.)
- Foskett & Co., 226-28 La Salle St., Chicago,  
Ill. "Holdfast." (Inner.)
- Hagstrom Eros. Mfg. Co., Lindsborg, Kans.  
"Hagstrom." (Inner tire.)
- Holyoke Tire Protector Co., Holyoke, Mass.  
"Holyoke."
- India Rubber Tire Co., 1461 Michigan Ave.,  
Chicago, Ill.
- Inner Shoe Tire Co., 64 Monroe St., Grand  
Rapids, Mich. "Innershu" (Inner tube.)
- Kimball Tire Case Co., 170 Broadway, Coun-  
cil Bluffs, Ia. (Steel armor.)
- ★Leather Tire Goods Co., Niagara Falls, N. Y.  
"Woodworth." (Auto & motorcycle.)
- Lighthouse, Chas. F., 877 Seventh Ave., N. Y.  
City. "Lighthouse." (Anti-skid tread.)
- Lynn Auto Co., 29 Sea St., Lynn, Mass.  
"Barrett." (Inner tire sleeves.)
- ★Mesinger, H. & F. Mfg. Co., 1801-03 First  
Ave., N. Y. City.
- Murray, A. L., Grand Rapids, Mich. "Mur-  
ray." (Inner shoes.)
- O'Neil Tire & Protector Co., Akron, Ohio.  
"O'Neil."
- Perkins, Campbell Co., The, 622 Broadway,  
Cincinnati, O. "Twentieth Century."
- Queen Mfg. Co., Webster City, Ia. "A.S.B."  
(Leather & steel treads.)
- Republic Rubber Tire & Shoe Co., Inc., 798  
10th Ave., N. Y. City. "Hercules" &  
"Goodworth."
- Security Reliner Co., Montgomery, N. Y.  
"Security." (Tire reliners.)
- Selbach Rubber Co., 471 Tremont St., Bos-  
ton, Mass. "Selbach." (Inner sleeves.)
- Slama Tire Protector Co., 1504 Grand St.,  
Kansas City, Mo. "Slama."
- Slip-Over Tire Co., 204 S. Boots St., Marion,  
Ind. "Slip-Over." (Emergency tires.)
- Standard Tire Protector Co., Saginaw, Mich.  
"Standard."
- ★Swinehart Clincher Tire & Rubber Co., Ak-  
ron, O. "Swinehart." (Anti-skid treads.)
- ★Thermoid Rubber Co., Trenton, N. J. "Tren-  
ton Triangle T."
- Triple Tread Auto Tire Mfg. Co., 1545 Michi-  
gan Ave., Chicago, Ill. "Triple Tread."  
(Treads.)
- ★20th Century Tire Protector Co., Midlothian,  
Texas. "20th Century."
- Universal Tire Protector Co., Angola, Ind.  
"Universal." (Detachable treads.)
- Waban Webbing Co., 16 South St., Boston,  
Mass. "Bullet Proof." (Inner tube pro-  
tector.)

Wahoo Auto Tire Protector Co., Wahoo, Neb.  
"Wahoo."  
Walker Auto Tire Band Co., 18-24 South East  
St., Indianapolis, Ind. "Walker."  
Warrior Tire Shoe Co., Holyoke, Mass. (Inner  
tube shoes.)

**TIRE PUMPS**

(See Pumps, Tire.)

**TIRE REPAIR ARTICLES,  
Automobile**

- (See also Cements, Tire; Tire Repair Com-  
pounds, Tire Repair Fluids, Tire  
Sleeves, Tire Sundries, Tire Tape,  
Vulcanizing Materials & Vulcanizing  
Solutions.)
- American Tire Co., Owosso, Mich. "Yankee."  
(Tire boots.)
  - Auto Goods Co., 41 Bowker St., Boston, Mass.  
"Cinch." (Plugs.)
  - Auto Time Saver Repair Kit Co., 178 Devon-  
shire St., Boston, Mass. "Time-Saver."  
(Tire repair plugs.)
  - Barrett Manufacturing Co., 17 Battery Place,  
N. Y. City. (Benzols & naphthas.)
  - Case Casing Co., The, Mt. Pleasant, Iowa.  
(Blow-out patches.)
  - Chicago Raw Hide Mfg. Co., 348-50 Ohio St.,  
Chicago, Ill. (Patches.)
  - Continental Rubber Works, Erie, Pa. (Inner  
tube patches.)
  - Cryder & Co., 583 Park Ave., N. Y. City.  
"Kempshall." (Emergency patches.)
  - Detroit Leather Works, 844 Woodward Ave.,  
Detroit, Mich. "Knight." (Bands.)
  - ★Diamond Rubber Co., Akron, O. "Diamond."  
(Plugs, patches, tread stocks & repair  
material.)
  - Double Fabric Tire Co., Auburn, Ind. (Patch-  
es.)
  - ★Empire Tire Co., Trenton, N. J. "Empire."  
(Tube patches.)
  - Empire Mfg. Co., 200 E. Exchange St., Akron,  
O. (Patches.)
  - F. H. B. Co., The, Ithaca, N. Y. "F. H. B."  
(Patches.)
  - ★Firestone Tire & Rubber Co., Akron, Ohio.  
"Firestone." (Patches, plugs, etc.)
  - ★Fisk Rubber Co., Chicopee Falls, Mass. "Fisk."
  - ★G & J Tire Co., Indianapolis, Ind. "G & J."  
(Patches & sheet rubber.)
  - ★Goodrich, B. F. Co., Akron, Ohio. (Emergency  
bands & patches.)
  - ★Goodyear Tire & Rubber Co., Akron, Ohio.  
"Goodyear." (Inner tube patches, raw  
gum, etc.)
  - Hagstrom Bros. Mfg. Co., Lindsborg, Kan.  
"Hagstrom." (Blow-out patches.)
  - Horsey Mfg. Co., 1246 Euclid Ave., Cleve-  
land, O. "Horsey." (Inside leather blow-  
out patches.)
  - India Rubber Tire Co., 1461 Michigan Ave.,  
Chicago, Ill. (Blow-out patches.)
  - Inner Shoe Tire Co., 64 Monroe St., Grand  
Rapids, Mich. "Shur Hold." (Patches of  
pliable fibre.)
  - K & W Mfg. Co., 25 Orange St., Ashland,  
Ohio. "K & W." (Reliners for protecting  
tires & inside blow-out patches.)
  - Kimball Tire Case Co., 170 Broadway, Coun-  
cil Bluffs, Ia. (Steel link bands for blow-  
outs.)
  - ★Leather Tire Goods Co., The, Niagara Falls,  
N. Y. "Woodworth." (Emergency straps  
& leather patches for repairing tire  
shoes.)
  - ★M. & M. Mfg. Co., Akron, O. (Inner tube  
splicers & tire repair patches.)

★ indicates Advertisers—see Index in back of book.

**TIRE REPAIR ARTICLES, Automobile—Continued**

- Mansfield Rubber Co., Mansfield, O. "Mansfield." (Patches.)
- Mattson Rubber Co., Lodi, N. J. (Plugs, patching rubber & tire repair stocks.)
- ★Mesinger, H. & F. Mfg. Co., 1801-03 First Ave., N. Y. City. "Mesinger." (Bands.)
- Michellin Tire Co., Milltown, N. J. "Michelin." (Rubber patches.)
- ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich.
- Murray, A. L., Grand Rapids, Mich. "Murray Double Lock" & "Murray First-Aid." (Patches.)
- National Leather Belting Co., 29 Ferry St., N. Y. City. "Crown," "Rawhide" & "Elk." (Chrome tire bands.)
- O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil." (Blow out patches and inner tube patches.)
- Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y. "Alpha." (Patches.)
- Parks, F. B. Co., 173-75 Prescott St., Grand Rapids, Mich. (Flat stem plugs.)
- Peerless Cement Co., The, 39 Viaduct, Akron, O. "Peerless." (Blowout patches & inner tube patches.)
- Quick-Tite Patch Co., The, Amsterdam, N. Y. "Quick-Tite." (Patches for inner tubes.)
- Republic Rubber Co., Youngstown, O. (Auto tire repair gum, fabrics, etc.)
- Seamless Rubber Co., New Haven, Conn. (Blow-out patches.)
- Security Refliner Co., Montgomery, N. Y. "Security." (Patches.)
- Selbach Rubber Co., 471 Tremont St., Boston, Mass. "Selbach." (Patches.)
- Shawmut Tire Co., The, Boston, Mass. "Shawmut" & "Meteor." (Blowout patches.)
- Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. ("Gray's Inset" for inner tubes; "Gray's" Patent Patch; "Gray's Fill Gum.")
- Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Lacing hooks for patches.)
- ★Thermoid Rubber Co., Trenton, N. J.
- Tingley, Chas. O. & Co., Rahway, N. J. ("C.O. T." rubber plugs and patches, rubber roughener, soapstone; "C.O.T. Gum Gum.")
- Traver Blowout Patch Co., 1779 Broadway, N. Y. City. "Traver." (Blow-out patch.)
- 20th Century Tire Protector Co., Midlothian, Texas. (Tire patches.)
- Voorhees Rubber Co., Jersey City, N. J. (Repair gums & frictions.)
- Waite-Auto Supply Co., 17 Dorrance St., Providence, R. I. "Wasco." (Inner tube patches.)
- Williams Mfg. Co., Camden, N. J. "Williams." (Rubber Putty.)
- Young, Orlando W., 174-80 Frelinghuysen Ave., Newark, N. J. (Patches.)

**TIRE REPAIR ARTICLES, Cycle & Motorcycle**

- ★Diamond Rubber Co., Akron, O. "Diamond." (Plugs & patches.)
- ★Fisk Rubber Co., Chicopee Falls, Mass. "Fisk." Hagstrom Bros. Mfg. Co., Lindsborg, Kans. "Hagstrom." (Blowout patches, motorcycle.)
- K & W Mfg. Co., 25 Orange St., Ashland, O. "K & W." (Reliners for protecting tires & inside blowout patches; motorcycle.)
- ★Mesinger, H. & F. Mfg. Co., 1801-03 First Ave., N. Y. City. (Motorcycle.)
- ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "N. S. U." (Puncture proof bands.)
- Parks, F. B. Co., 173-75 Prescott St., Grand Rapids, Mich. (Flat stem tire plugs.)

- Stevens & Co., 375 Broadway, N. Y. City. "Sampson." (Brass plugs, cycle.)
- Tingley, Chas. O. & Co., Rahway, N. J. "C.O. T." (Rubber plugs & patches.)
- Young, Orlando W., 174-180 Frelinghuysen Ave., Newark, N. J.

**TIRE REPAIR COMPOUNDS**

- Tirescle Co., The, 53-55 Bank St., Newark, N. J. "Tirescle."

**TIRE REPAIR FLUIDS**

- ★Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. "Gline's." (Liquid rubber.)

**TIRE REPAIRING & VULCANIZING**

- ★Baines Moore Tire Co., The, 1306 Callowhill St., Phila., Pa. (Retreading tires.)
- ★Firestone Tire & Rubber Co., Akron, O. Foote, D. E. Rubber Co., 1837 Euclid Ave., Cleveland, O. (Repairing & remaking auto tires.)
- Stoddard, C. H., 10 Waldo St., Worcester, Mass. (Vulcanizing.)
- Trautman, Ira F., 131 Sixth Ave., Brooklyn, N. Y. (Vulcanizing.)

**TIRE REPAIR KITS, Automobile**

- Auto Goods Co., 41 Bowker St., Boston, Mass.
- Auto Time Saver Repair Kit Co., 178 Devonshire St., Boston, Mass. "Time-Saver."
- Continental Caoutchouc Co., 1788-90 Broadway, N. Y. City.
- Empire Mfg. Co., 200 E. Exchange St., Akron, O.
- ★Firestone Tire & Rubber Co., Akron, Ohio. "Firestone."
- ★Goodrich, B. F. Co., Akron, O. "Jiffy." Michelin Tire Co., Milltown, N. J. "Michelin." Peerless Cement Co., The, 39 Viaduct, Akron, O. "Peerless."
- Rock Island Specialty Mfg. Co., Rock Island, Ill. "Beatsemall."
- Tingley, C. O. & Co., Rahway, N. J.

**TIRE REPAIR KITS, Cycle & Motorcycle**

- ★Goodrich, B. F. Co., Akron, O. "Jiffy." Neal, F. M. Co., 1048 E. Main St., Bridgeport, Conn. "Neal."
- Rock Island Specialty Mfg. Co., Rock Island, Ill. "Beatsemall."
- Tingley, Chas. O. & Co., Rahway, N. J. (Motorcycle.)

**TIRE ROUGHENERS**

- American Wire Brush Co., 277 Greenwich St., N. Y. City.

**TIRE SLEEVES**

- Adwear Auto Tire Sleeve Co., The, N. Attleboro, Mass. "Add-Wear."  
 Alsten & Goulding, 36 Foster St., Worcester, Mass. "Alding." (Leather.)  
 American Tire Co., Owosso, Mich. "Yankee."  
 Chicago Raw Hide Mfg. Co., 348-50 Ohio St., Chicago, Ill.  
 ★Diamond Rubber Co., Akron, Ohio. "Wiles."  
 Foskett & Co., 226-28 La Salle St., Chicago, Ill. "Brennan."  
 ★G & J Tire Co., Indianapolis, Ind. "G & J."  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass. "G. & K."  
 Home Tire Co., Trenton, N. J. "Home." (Inner & outer.)  
 India Rubber Tire Co., 1461 Michigan Ave., Chicago, Ill.  
 Inner Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich. "Shur Hold" & "Extra Wear."  
 Kimball Tire Case Co., 170 Broadway, Council Bluffs, Ia.  
 ★Leather Tire Goods Co., The, Niagara Falls, N. Y. "Woodworth."  
 Michelin Tire Co., Milltown, N. J. "Michelin." (For inner tubes.)  
 O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil."  
 ★Peerless Cement Co., The, 39 Viaduct, Akron, O. "Peerless."  
 Seamless Rubber Co., New Haven, Conn.  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's Resisto," "Gray's Waterproof," "Gray's Everwear" & "Gray's Blanco."  
 Universal Tire Protector Co., Angola, Ind. "Universal."  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, Ohio. "Gordon." (Raw-hide non-skid.)

**TIRE SUNDRIES**

- Continental Caoutchouc Co., 1788-90 Broadway, N. Y. City.  
 Massachusetts Automobile Co., 52 Church St., Boston, Mass.  
 ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich.  
 Shawmut Tire Co., The, Boston, Mass. "Shawmut" & "Meteor."

**TIRE TALC**

(See Talc, Tire.)

**TIRE TAPE**

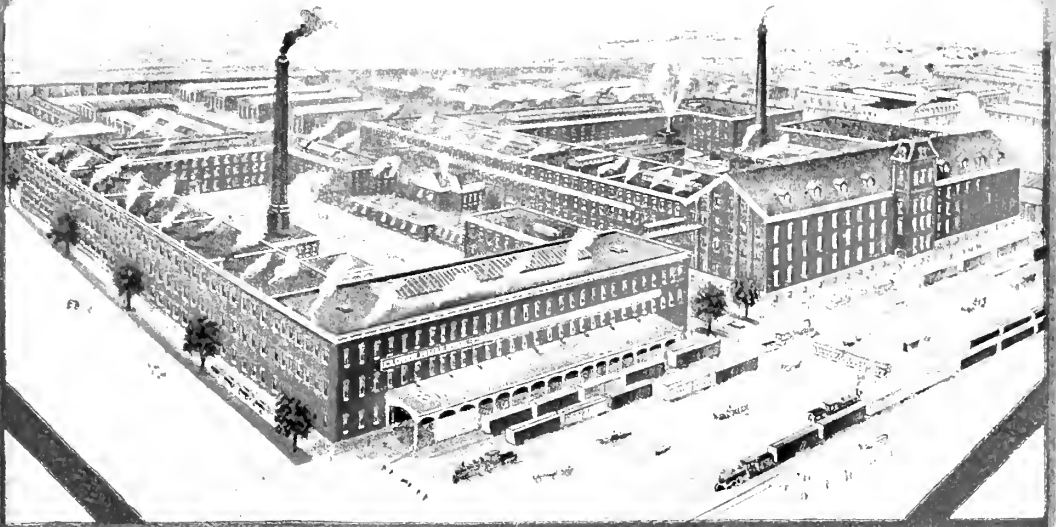
- Fry, Keyser, 723-25 Chestnut St., Reading, Pa. "Ever Right."  
 ★G & J Tire Co., Indianapolis, Ind. "G & J."  
 ★Goodrich, B. F. Co., Akron, Ohio.  
 Tingley, Chas. O. & Co., Rahway, N. J.  
 Walpole Rubber Works, Walpole, Mass. "Walpole."

**TIRE TOOLS, Automobile**

- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.  
 Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa.  
 ★Auto Improvement Co., The, 304 Hudson St., N. Y. City.  
 Auto Specialty Co., 85-87 Pearl St., Boston, Mass. (To order.)  
 ★Buffalo Specialty Co., 375-377 Ellcott St., Buffalo, N. Y. "Neverleak." (Injector.)  
 Courtney Rubber Co., The, 1976 Broadway, N. Y. City. "Courtney."  
 Cranmer, Harry C., 217 S. 24th St., Phila., Pa.  
 ★Diamond Rubber Co., Akron, O. "Diamond."  
 Duane, W. J. & Co., 230 W. 58th St., N. Y. City.  
 Empire Mfg. Co., 200 E. Exchange St., Akron, O. "Hold-Tight." (Vise.)  
 ★Empire Tire Co., Trenton, N. J. "Empire."  
 ★Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill. "XLCR."  
 ★Firestone Tire & Rubber Co., Akron, Ohio. "Firestone."  
 ★G & J Tire Co., Indianapolis, Ind. "G & J."  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 ★Goodrich, B. F., Akron, Ohio.  
 Heller, L. L., Water St., Binghamton, N. Y. "H. & H."  
 Hibbard, Spencer, Bartlett & Co., Chicago, Ill. "Our Very Best" & "Rev-o-noc."  
 Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill.  
 Konigsow, Otto Mfg. Co., Central Ave. & C. & P. R. R., Cleveland, O.  
 Long & Mann Co., The, 13 Graves St., Rochester, N. Y. "L. & M." & "Minute." (Tire adjusters.) "L. & M." (Tire shoe lifters & looseners.)  
 Michelin Tire Co., Milltown, N. J. "Michelin."  
 Miller, Chas. E., 97-101 Reade St., N. Y. City. "Diamond M."  
 ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I. "Second Man."  
 ★Motor Car Supply Co., The, 1451-1455 Michigan Ave., Chicago, Ill.  
 National Jack & Mfg. Co., 132-34 S. Clinton St., Chicago, Ill.  
 Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. "Six In One." (Motorists' tools.)  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.  
 Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O. "Osborn." (Roughing brushes.)  
 Parks, F. B. Co., 173-75 Prescott St., Grand Rapids, Mich. (Plugging pliers & cement injectors.)  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. "Phoenix." (And presses.)  
 Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson."  
 Rhodes Mfg. Co., The, Grand Rapids, Mich. "Rhodes."  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.  
 Shawver Co., The, Springfield, O.  
 Smith, J. Stewart, 1779 Broadway, N. Y. City. "Dollar."  
 Spencer, I. S. Sons, Guilford, Conn.  
 Standard Leather Washer Mfg. Co., 22-26 Boudinot St., Newark, N. J. "Gray-Squeeze-It." (Device for vulcanizing.)  
 "Unedme" Tool Co., Bottles & Factory Sts., Columbus, O. "Unedme."  
 U. S. Jack Co., 644 W. Lake St., Chicago, Ill. "Atlas."  
 Universal Auto-Tire Remover, 948 Market St., Room 412, San Francisco, Cal. "Universal."  
 Walden Mfg. Co., 65 Bacon St., Worcester, Mass. "Walden." (Tire lug ratchet wrenches.)  
 Wall, R. C. Mfg. Co., 1334-36 Race St., Phila., Pa.  
 Western Tool & Forge Co., Brackenridge, Pa. (Tire irons & spreaders.)

★ Indicates Advertisers—see Index in back of book.

Birdsell Farm Wagon, Clover and Alfalfa Huller Works, South Bend, Indiana, U. S. A.



## COMMERCIAL POST CARDS

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The process of sheining and bunching—Brainerd & Armstrong's Embroidery Silk Department.





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Representing the above firm, I take pleasure in advising that I will call on you on or about

when I hope you will be in a position to place an order with me. Any orders you favor me with will receive prompt and careful attention.

Yours respectfully,



## TIRE TOOLS, Cycle & Motorcycle

- ★Goodrich, B. F. Co., Akron, Ohio. "Jiffy."
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. (Plug pliers.)
- Wald Mfg. Co., Sheboygan, Wis. "Wald."

## TIRE VALVES

- Breakstone, S., 1712 Michigan Ave., Chicago, Ill. "Edco." (Imported.)
- Clayton, F. F., Sandwich, Mass. "Clayton's."
- ★Diamond Rubber Co., Akron, O. "Diamond."
- Dien, Ch., 45 W. 34th St., N. Y. City. "Edco." (Imported.)
- Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y.
- Huestis Mfg. Co., Bristol, R. I. "Never Leak."
- Michelin Tire Co., Milltown, N. J. "Michelin."
- ★Schrader's, A. Sons, Inc., 28-32 Rose St., N. Y. City. "Schrader Universal."
- Stewart, Alfred C. Machine Works, 1008 San-tee St., Los Angeles, Cal. "Stewart." (Auxiliary.)
- United & Globe Rubber Mfg. Co., Trenton, N. J.

## TIRE VALVE PARTS

- ★Diamond Rubber Co., Akron, Ohio. "Diamond."
- ★G & J Tire Co., Indianapolis, Ind. "G & J." (Valve bases.)
- Mattson Rubber Co., Lodi, N. J. (Bases.)
- ★Michelin Tire Co., Milltown, N. J. "Michelin." (Lug & valve caps.)
- Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. (Caps. & bushings.)

## TIRE VALVE STEMS

- Continental Rubber Works, Erie, Pa.
- ★Diamond Rubber Co., Akron, O.
- ★Goodrich, B. F. Co., Akron, O.
- Schwepe & Wilt Mfg. Co., Meldrum & Cham-plain Sts., Detroit, Mich.

## TIRE VALVE TOOLS

- Auto Parts Co., 10 Weybosset St., Provi-dence, R. I. "Apco."
- Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. "Noonan's." (Pliers & valve rethreading tool.)
- Reece, E. F. Co., Greenfield, Mass. "Her-cules."

## TOE CLIPS

- Bevln Bros. Mfg. Co., East Hampton, Conn.
- ★Standard Co., The, Torrington, Conn. "Sager" & "Star."

## TOILET CASES

(See Limousine Fittings.)

## TOOL BAGS, Cycle & Motorcycle

- ★Mesinger, H. & F. Mfg. Co., 1801-03 First Ave., New York, N. Y.
- Motorcycle Specialty Co., 258 Columbus Ave., Boston, Mass. (Motorcycle leather boxes.)
- Troxel Mfg. Co., Elyria, O.
- Widmayer, F. B. Co., 2312 Broadway, N. Y. City. (Motorcycle.)
- Wolverine Leather Goods Co., 51-59 Fort St., E., Detroit, Mich. (Cycle.)

## TOOL BAGS & ROLLS, Automobile

- ★Buffum Tool Co., Louisiana, Mo. (Rolls.)
- Excelsior Implement Co., Troy, N. Y. "Ex-celsior Brand Can't Rip."
- Feeser, Frank S. Co., 1104 Prospect St., In-dianapolis, Ind. "Superior."
- Gilbert Mfg. Co., New Haven, Conn. "Gil-ber't." (Rolls.)
- Hager, Chas. & Son, 244-46 E. 52nd St., N. Y. City.
- ★Hopewell Bros., 29 Chapel St., Newton, Mass. "Hopewell." (Rolls.)
- Mau-Sherwood Supply Co., 1616 W. Third St., Cleveland, O. (Bags.)
- ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan." (Rolls.)
- Perkins-Campbell Co., The, 622 Broadway, Cincinnati, Ohio. "Campbell." (Leather tool cases.)
- Planet Co., The, Westfield, Mass. "Planet." (Rolls.)
- Rex Shield & Mfg. Co., Connersville, Ind. "Rex." (Cases.)
- Springfield Harness Co., 27-29 Dwight St., Springfield, Mass. (Pouches.)
- Troxel Mfg. Co., Elyria, O.
- ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon."
- Warner Pole & Top Co., 1648 Centre Ave., Cincinnati, O. "Warner."
- Wieland, Chas., 147 & 149 Chambers St., N. Y. City.
- Wiley, The Wm. H. & Son Co., Box 78, Hart-ford, Conn.
- ★Winship, W. W., 71 Summer St., Boston, Mass.
- Wolverine Leather Goods Co., 51-59 Fort St., East, Detroit, Mich.

## TOOL BOXES, Automobile

- A-Z Co., The, 527-9 W. 56th St., N. Y. City. "A-Z." (Metal.)
- American Body Co., The, 1255-63 Niagara St., Buffalo, N. Y. (Also trays.)
- Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. "Quality."
- Auto Radiator Repairing Co., 1317 Vine St., Phila., Pa.
- Auto Sheet Metal Works, 2228 Michigan Ave., Chicago, Ill.
- Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich. (Metal.)
- Clayton's, Sons, Frank B., 1222-24 Race St., Phila., Pa.
- Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich. (Metal.)
- Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City.
- ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, Ohio. "Globe." (Sheet steel.)
- Guarantee Tire & Rubber Co., The, 208-210 S. Illinois St., Indianapolis, Ind. "Long Distance."
- Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich. (Metal.)

**TOOL BOXES, Automobile—Continued**

- Jordan, Edward B. & Co., 129 De Graw St., Brooklyn, N. Y. (Wood.)  
 Kinsey Mfg. Co., Toledo, O. "Kinwood."  
 Marbach, F. G. Co., Medina, O. "20th Century."  
 Maron, Frank A., 320-322 Pearl St., N. Y. City.  
 ★Motor Car Supply Co., The, 1451-1455 Michigan Ave., Chicago, Ill.  
 New Britain Sheet Metal Co., New Britain, Conn. (Metal.)  
 Noye Mfg. Co., Buffalo, N. Y. (Metal.)  
 Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O.  
 Racine Mfg. Co., Racine, Wis.  
 Schoenborn, A. J., 109 S. 14th St., Atchison, Kan.  
 Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill. (To order.)  
 Standard Cabinet Mfg. Co., Peru, Ind.  
 Stoll Pressed Steel Co., Buffalo, N. Y. (Metal.)  
 Tolliner's, Chas. Sons Co., Pulaski, N. Y. (Wood.)  
 West, F. M., Box Co., Springfield, Mass.  
 ★Winship, W. W., 71 Summer St., Boston, Mass.

**TOOL BOXES, Motorcycle**

- Auto Radiator Repairing Co., 1317 Vine St., Phila., Pa.  
 Capitol Specialty Works, 147 Hudson Ave., Albany, N. Y.  
 Widmayer, F. B. Co., 2312 Broadway, N. Y. City.

**TOOL ROLLS**

(See Tool Bags &amp; Rolls.)

**TOPS, Automobile**

- Acme Auto Windshield & Top Co., Indianapolis, Ind.  
 Acme Veneer & Body Co., Rahway, N. J.  
 American Auto Top Mfg. Co., 1608-12 W. Lake St., Chicago, Ill.  
 American Leather Mfg. Co., Newark, N. J. "Stag Brand." (Leather.)  
 American Top Co., Jackson, Mich.  
 Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. "Quality."  
 Atkins & Townsend, Felton, Del. "Atkins."  
 Auto Top & Body Co., 249 N. Watt St., Phila., Pa.  
 ★Auto Top Co., The, 209 E. Columbia St., Fort Wayne, Ind.  
 Auto Top & Trimming Co., Pontiac, Mich.  
 Auto Wind Shield Co., Cambridge, Mass.  
 Bailey & Bowne, Whitesboro & Wiley Sts., Utica, N. Y.  
 Eall Buggy Top Co., York, Pa.  
 Baltimore Buggy Top Co., 700 Pennsylvania Ave., Baltimore, Md.  
 ★Barndt-Johnston Auto Supply Co., The, 408-426 Donaldson St., Columbus, O.  
 Bauer Bros. Mfg. Co., Richmond & Carr Sts., Cincinnati, O.  
 Biehl Auto Top Co., 31 S. 5th St., Reading, Pa.  
 Blasler, The M. E. Mfg. Co., 65-67 Columbia St., Utica, N. Y.  
 Bliss, C. P. Auto Top Co., 2306 Walnut St., Denver, Colo.  
 Blue Ribbon Auto & Carriage Co., Cannon St., Bridgeport, Conn.  
 Bohnet, John & Co., 114-116 Grand Ave., South, Lansing, Mich.  
 Bosche Bros., 920 Main St., Buffalo, N. Y.  
 Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn.  
 Broadway Auto Top & Body Co., 136 West 54th St., N. Y. City.  
 Brunn's Carriage Mfg. Co., 1140-48 Main St., Buffalo, N. Y.  
 Buffalo Auto Body & Trimming Co., 341 Elliott St., Buffalo, N. Y.  
 Buffalo Auto Body & Trimming Co., 341 Elliott St., Buffalo, N. Y.  
 Buob & Scheu, 1408-10 Gilbert Ave., Cincinnati, O.  
 Chicago Carriage & Trimming Co., 1908-1912 Indiana Ave., Chicago, Ill. (To order.)  
 Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.  
 Cisler & Serson, 3111 Michigan Ave., Chicago, Ill.  
 Cole & Woop, 42-50 W. 67th St., N. Y. City.  
 Columbia Auto Top Co., 17 Dwight St., Springfield, Mass.  
 Columbia Tire & Top Co., 31 Irvington St., Boston, Mass. "Columbia."  
 Consumers' Auto Supply Co., The, 412 Diamond St., Pittsburg, Pa. "Simplicity."  
 Cray Bros., 1111-1115 W. 11th St., Cleveland, Ohio.  
 Cream City Trimming Co., 67-69 Juneau Ave., Milwaukee, Wis.  
 Cutter, J. Frank, 414 Main St., Cambridge, Mass.  
 Dayton Auto Top Co., Dayton, O.  
 Delmar Auto Body Wheel Co., Indianapolis, Ind.  
 Demar, J. E. Co., 244-48 W. 49th St., N. Y. City.  
 Denniston, E. E., 184 W. Mohawk St., Buffalo, N. Y.  
 Detroit Motor Car Supply Co., 1230 Jefferson Ave., Detroit, Mich. "Wishbone Rival."  
 Diamond Auto Top Construction Co., 220 W. 48th St., N. Y. City.  
 Duane, W. J. & Co., 230 W. 58th St., N. Y. City.  
 Dunham, D. B. & Co., 128-132 Irving St., Rahway, N. J.  
 Eckland Bros., 110½ Sixth St., Minneapolis, Minn.  
 Eureka Co., The, Rock Falls, Ill. "Eureka."  
 Everitt, The B. F. Co., 506 Clay Ave., Detroit, Mich.  
 Falls City Buggy Top Co., 200 E. Main St., Louisville, Ky.  
 Fickling & Co., Inc., 304-306 W. 49th St., New York, N. Y.  
 Fitzgibbon & Crisp Carriage & Wagon Co., 28-36 Bank St., Trenton, N. J. "Lion."  
 Flint Auto Top Co., Flint, Mich.  
 Folger & Drummond, Amesbury, Mass.  
 Ford Auto Equipment Co., Inc., 1735 Michigan Ave., Chicago, Ill.  
 Frank, W. H., 22 Harrison St., New Rochelle, N. Y.  
 Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y.  
 Gates-Osborne Mfg. Co., Marshalltown, Ia.  
 Goshen Buggy Top Co., The, Goshen, Ind.  
 Harlow, Willard Mfg. Co., Janesville, Wis. "Harlow."  
 Hawes Storm Front Co., 25 N. Hanchett St., Coldwater, Mich. "Hawes."  
 Hill Mfg. Co., The, 25-27 Fuller St., Buffalo, N. Y. "Hill."  
 Holbrook-Singer Co., 509-515 W. 56th St., N. Y. City.  
 Holcker-Elberg Mfg. Co., N. E. cor. 16th & McGee Sts., Kansas City, Mo. "Holcker-Elberg."  
 Holcomb Co., 105 Goffe St., New Haven, Conn. "Holcomb."  
 Horstman, Louis F., 107 E. Superior St., Ft. Wayne, Ind.  
 Howarth & Rogers Co., Oak St., Amesbury, Mass.

**TOPS, Automobile—Continued**

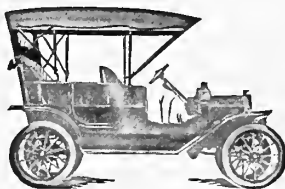
Hume Carriage Co., 66-68 Stanhope St., Boston, Mass.  
 Ideal Wind Shield Co., Inc., 1926 Broadway, N. Y. City. "Ideal."  
 Indianapolis Auto Top & Rubber Co., Indianapolis, Ind.  
 Indianapolis Dash Co., The, 2116-18 S. Meridian St., Indianapolis, Ind.  
 Indiana Top & Vehicle Co., Lawrenceburg, Ind.  
 Iroquois Auto Top Co., 179-183 Blandina St., Utica, N. Y.  
 Irvin, R. J. Mfg. Co., 216-22 W. McCarty St., Indianapolis, Ind.  
 Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.  
 Kansas City Vehicle Co., 2nd & Main Sts., Kansas City, Mo.  
 Kendallville Buggy Co., The, Kendallville, Ind.  
 Kenyon, The R. L. Co., Waukesha, Wis. "Kenyon."  
 Kimball, C. P. & Co., 315 Michigan Ave., Chicago, Ill.  
 King Top Mfg. Co., Main & First Sts., Dayton, O. "King."  
 Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill.  
 Kroh, C. Z. Mfg. Co., 1212-1214 Jackson St., Toledo, O. "Kroh."  
 Kundtz, Theodore, Cleveland, Ohio. "Kundtz." (Wooden.)  
 Lane, T. W., Amesbury, Mass.  
 ★La Porte Carriage Co., La Porte, Ind. "La Porte."  
 London Auto Supply Co., 2540-48 Wabash Ave., Chicago, Ill. "London."  
 Longdin-Brugger Co., Fond-Du-Lac, Wis.  
 Loud, Fred A., 88 Stanhope St., Boston, Mass.  
 McClellan, Chas. P., Fall River, Mass.  
 Mammoth Mfg. Co., White Plains, N. Y.  
 Maus, W. L., 736 W. Colfax Ave., Denver, Colo.  
 Meyer, C. C. & Son, Tiffin, O.  
 Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich. "Wishbone."  
 Michigan Top Co., 90 Woodward Ave., Detroit, Mich.  
 Modern Autop & Equipment Co., 607 St. Claire Ave., N. E., Cleveland, O. "Modern."  
 Mott, F. & Co., 491 Washington St., Newark, N. J.  
 Mount, J. W. Co., Maple Ave. & White St., Red Bank, N. J.  
 Mullholland Co., Dunkirk, N. Y.  
 Murray, P. A. & Co., Newton, Mass.  
 Myers Auto Top Co., The, S. E. Cor. First & St. Clair Sts., Dayton, O.  
 National Auto Top Co., 1904 Broadway, N. Y. City.  
 Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.  
 New England Auto Top Co., 128 W. 52nd St., N. Y. City.  
 Newton, W. H. & Son, 127 Elm St., Cortland, N. Y. "Excelsior."  
 Nichols, D. P. Co., 11 Edgewood St., Roxbury, Mass.  
 Norris, R. Milton, 516-518 W. Baltimore St., Baltimore, Md.  
 Olsen, C. J. & Son, Pittsboro, Ind.  
 Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill.  
 Paterson Vehicle Co., 257 Market St., Paterson, N. J.  
 Pease, S. C. & Sons, Merrimac, Mass.  
 Peck-Reese Auto Top Co., The, 151 Main St., Cortland, N. Y.  
 Peerless Buggy Top Co., S. W., Cor. Central Ave. & York St., Cincinnati, Ohio. "Peerless."  
 Penniman & James, 556-64 Main St., Cambridge, Mass.  
 Phelps, F. Z. Auto Top & Trimming Co., 1292 Niagara St., Buffalo, N. Y.  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. "Phoenix."

# TOPS

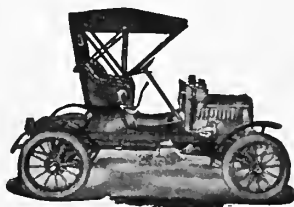
## Measurements on file for

1910 Maxwells  
 1910 Buicks  
 1910 Chalmers-Detroit 30  
 1910 Cadillac  
 1910 E. M. F.  
 1910 Regal  
 1910 Hudson  
 1910 Fords  
 1910 Hupmobile  
 1910 Oakland  
 1910 Franklin "D"  
 1910 Reo, 4-cyl.  
 1910 Courier  
 1910 Pickard

Also Nearly all Measurements  
 of 1907-1908-1909 Cars



No. 200 Style



No. 100 Style

**W. H. NEWTON & Son**  
 123 Elm Street  
 CORTLAND, N. Y.

**TOPS, Automobile—Continued**

- Quimby, J. M. & Co., 21-39 Division St., Newark, N. J.  
 Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis. "The Racine."  
 Racine Mfg. Co., Racine, Wis.  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.  
 Rearden, J. J., Amesbury, Mass.  
 Reynolds, The E. W. Mfg. Co., 1008-10 Jackson St., Omaha, Neb.  
 Ritter Mfg. Co., 63-69 Amsterdam St., Detroit, Mich.  
 Robbins, Irvin & Co., Industrial Bldg., 10th St., Indianapolis, Ind.  
 Robinson, H. H. Mfg. Co., Des Moines, Ia. "Robinson."  
 ★Rothschild & Co., 530-532 West 27th St., N. Y. City.  
 ★Schubert Bros. Gear Co., 44 Cedar St., Oneida, N. Y. "Schubert."  
 Snow, N. H., 26 Hawley St., Binghamton, N. Y.  
 ★Sprague Umbrella Co., Norwalk, O. "Sprague."  
 Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass.  
 Springfield Harness Co., 27-29 Dwight St., Springfield, Mass.  
 Springfield Metal Body Co., 364 Birnie Ave., Springfield, Mass. "Springfield."  
 Standard Auto Top Co., 239 W. 50th St., N. Y. City.  
 Standard Top Co., The, 1120-31 Capouse Ave., Scranton, Pa.  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 Stratton, C. H. Carriage Co., Muncie, Ind. "Stratton." (Folding.)  
 Taylor, C. V., Pontiac, Mich.  
 Teel Mfg. Co., Medford, Mass. "Teel."  
 Thompson, E. J. Co., 5917-19 Penn Ave., Pittsburgh, Pa.  
 ★Troy Carriage Sunshade Co., Troy, O.  
 U. S. Dash & Fender Co., 127 W. 49th St., N. Y. City.  
 Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo. "Vesco."  
 Vetter Top Co., 49 & 51 W. 66th St., N. Y. City.  
 Wallis Coach & Carriage Works, 12-14 E. Grant St., Minneapolis, Minn.  
 Warner Pole & Top Co., 1648 Centre Ave., Cincinnati, O. "Warner."  
 Wayman & Murphy, Lake & Sangamon Sts., Chicago, Ill.  
 Wayne Auto Top Co., 1113 Peach St., Erie, Pa.  
 Werner, Geo. & Sons, 1133-37 Main St., Buffalo, N. Y.  
 Westchester Appliance Co., 13-15 Canal Place, Bronx, N. Y. City.  
 Western Auto Top Co., 1122-24 E. 15th St., Kansas City, Mo.  
 Wisconsin Auto Top Co., Racine, Wis. "Badger."  
 Wood, Frederick R. & Son, 217 W. 19th St., N. Y. City.  
 Wright, C. E. & Co., Norfolk, Va.  
 Zimmerman, F. F. & Sons, Waupun, Wis. "Zimmerman."

**TOP BOWS**

(See Bows.)

**TOP DRESSING**

- Alder-Harper Chemical Co., Mount Vernon, N. Y. "Star-Clean."  
 Anderson Varnish Co., 3214 Sheffield Ave., Chicago, Ill. (Dyes & enamels.)

- Aquila Chemical Co., 187 Third St., Milwaukee, Wis. "Aquila" & "Lustre."  
 ★Baum's Castorine Co., Rome, N. Y. "Baum's."  
 ★Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. "Peerless."  
 Cummer, The James W. Co., 2900 E. 34th St., Cleveland, O. "Perfect."  
 Detroit Varnish Co., Detroit, Mich. "Rogers."  
 Dix Mfg. Co., Lewistown, Pa. "Dix Life of Leather." (Waterproof.)  
 Enamelac Varnish Co., Racine, Wis. "Enamelac."  
 Hollingshead, The R. M. Co., Camden, N. J. "Whiz."  
 Jewel Mfg. Co., 21st & Marshall Blvd., Chicago, Ill. (Leather dressing.)  
 Johnston Paint Co., 226 Main St., Cincinnati, O. "Leatherlac." (Also for seats.)  
 Lowe Bros. Co., The, Dayton, O. (Enamel.)  
 Lucas, John & Co., Phila., Pa. "Lucas."  
 Miller, Frank Co., 349-51 W. 26th St., N. Y. City.  
 Muller & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y.  
 Oriental Leather Finish & Chemical Co., The, 493 Union St., Lynn, Mass. "Sombrekol," "Salamka" & "Sabiska."  
 Royal Leather Color Co., 62 Pearl St., Buffalo, N. Y. "Royal." (Leather dressing.)  
 Schmoeger, F. A., Sterling, Ill. "Sterling."  
 Schrack, C. & Co., 152-58 N. 4th St., Phila., Pa.  
 ★Weiss Polish Works, 714 S. Marshfield Ave., Chicago, Ill. "Mats." (Leather dressing.)  
 Weiss & Son, Chas., 4800 Cottage Grove Ave., Chicago, Ill.  
 ★West Mfg. Co., 120 N. Madison St., Rockford, Ill. "West's Enamel" & "New West."  
 Zinsser, Wm. & Co., 195 William St., N. Y. City. (Leather dressing.)

## West's Dressing FOR AUTOMOBILE TOPS

will *renew the finish* on the automobile top, and make it *look like new*.

It is specially prepared to stand the hard service to which an automobile is subjected in all kinds of weather, and is adapted to *enamel leather, rubber, pantasote*, and all *artificial leathers*, light as well as dark. Is slightly slower drying than the West's Enamel, for so many years the standard dressing for carriage tops, but will dry dust-proof over night.

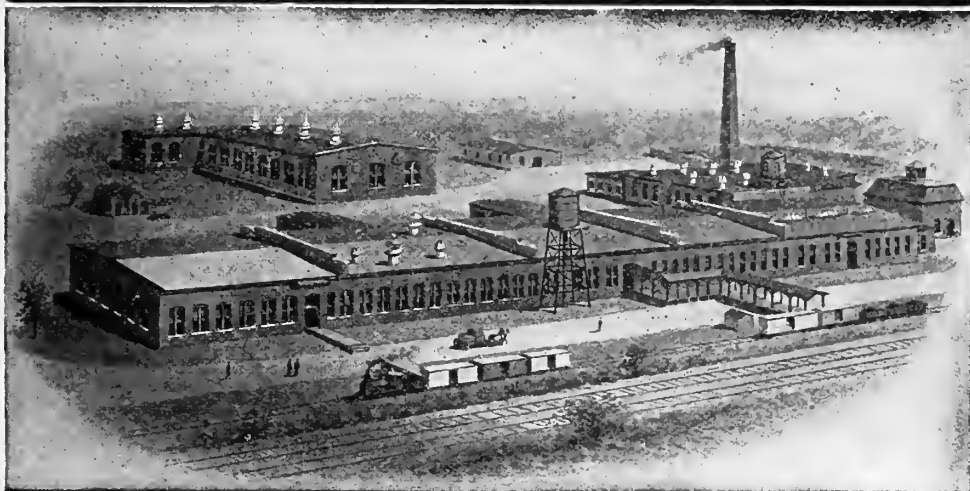
Nothing equal to *West's*. It is better than the best of any other make. Send for sample on paper which you can roll and crumble, but never crack.

It is put up in pint, quart and half-gallon cans, and sold only by dealers in Automobile Supplies everywhere.

PRICES QUOTED TO DEALERS

### West Manufacturing Co.

Manufacturers of Carriage Top Dressings  
**ROCKFORD, ILL.**



# CHASE

## AUTO TOP FABRICS

The line of honest top materials at honest prices.

CHASE AUTO CLOTHS are made entirely in our own mills (see cut), under our personal supervision and are consequently always of uniform quality and finish.

Satisfied customers bring you new and repeat orders, and QUALITY is therefore your chief consideration in the purchase of top materials.

CHASE QUALITY IS RIGHT, and our line is complete in every detail.

MACKINTOSH CLOTHS in Pure Mohairs, Lustres, Cravenettes, with full range of backings.

CHASE RUBBER CLOTHS, unsurpassed in quality.

CHASE LEATHER, recognized as the best leather substitute made for top coverings and motor car upholstery.

Investigate the CHASE line before purchasing top materials. It will pay you.

Samples on request.

### L. C. CHASE & CO.

BOSTON

NEW YORK

CHICAGO

SAN FRANCISCO

**TOP DUST COVERS**

- Baltimore Buggy Top Co., 700 Pennsylvania Ave., Baltimore, Md.  
 Bohnet, John & Co., 114-116 Grand Ave., S. Lansing, Mich.  
 Cream City Trimming Co., 67-69 Juneau Ave., Milwaukee, Wis.  
 Enterprise Brass & Plating Co., The, Cincinnati, O. "Monarch."  
 Falls City Buggy Top Co., 200 E. Main St., Louisville, Ky.  
 Gilliam Mfg. Co., The, Canton, Ohio. "Gilliam's."  
 Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan's."  
 Racine Mfg. Co., Racine, Wis.  
 Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass.  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich.  
 ★Vehicle Apron & Hood Co., The, 272 N. 4th St., Columbus, O. "Gordon."  
 Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo. "Vesco."  
 Western Auto Top Co., 1122-24 E. 15th St., Kansas City, Mo.

**TOP FIXTURES**

- (See also Curtain Fasteners, Body Irons, Top Irons, Bow Rests & Bow Separators.)  
 Baldwin, E. N., Shelton, Conn. (Stump joints, joint ends, coach eyes, joint rivets & washers.)  
 Blakeslee Forging Co., Plantsville, Conn. (Top joints.)  
 Cortland Carriage Goods Co., Cortland, N. Y. "Ajax." (Top joints.)  
 ★Cortland Forging Co., Cortland, N. Y. "Ajax." (Top joints.)  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. ("Elm City" Stump joints; "Thomas" top props & top fasteners.)  
 Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."  
 Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 ★Douglas & Lomason Co., 302 Grand River Ave., Detroit, Mich.  
 Druen, B. D., New Haven, Conn.  
 English & Mersick Co., The, 122-26 Winchester Ave., New Haven, Conn. (Top fasteners.)  
 Enterprise Brass & Plating Co., The, Cincinnati, Ohio. "Monarch." (Curtain lights, knobs, knob eyelets, top props & prop nuts.)  
 Essex Brass Foundry Co., 141-45 Main St., Cambridge, Mass. "Essex." (Top supports.)  
 Fowler Brass Works, 2333-37 Wabash Ave., Chicago, Ill.  
 Goshen Eyelet Co., Goshen, Ind.  
 Grossman, Emil Co., 232 W. 58th St., N. Y. City. "Universal." (Reels.)  
 Higgin Mfg. Co., Newport, Ky. (Top props, leather loops, eyelets, top prop nuts, knobs, curtain lights.)  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Keeler Brass Co., Grand Rapids, Mich. "Keeler."  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City.  
 Neider, F. A. Co., Augusta, Ky., (Prop nuts.)

- Novelty Mfg. Co., The, Maple St., Waterbury, Conn. (Prop nuts.)  
 Ritter Mfg. Co., 63-69 Amsterdam St., Detroit, Mich. (Fastenings.)  
 Robinson, H. H. Mfg. Co., Des Moines, Ia. "Robinson." (Top joints.)  
 Scherer, H. & Co., Detroit, Mich. (Top joints.)  
 Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. (Brass.)  
 Springfield Harness Co., 27-29 Dwight St., Springfield, Mass. (Extension joints for tops.)  
 Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Eyelets & grommets.)  
 Ten Eick, Cornelius, 523 W. 47th St., N. Y. City. (Top fasteners.)  
 Union Forging Co., Union, N. Y. (Canopy ends, stump joints & joint ends.)

**TOP IRONS**

- Amesbury Brass & Foundry Co., Amesbury, Mass. (Slats.)  
 Anderson Forge & Machine Co., 18 St. Aubin Ave., Detroit, Mich.  
 Cortland Carriage Goods Co., Cortland, N. Y. (Shifting rails.)  
 ★Cortland Forging Co., Cortland, N. Y. "Ajax." (Shifting rails & adjustable goosenecks.)  
 ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "New York" & "Philadelphia." (Slat irons.)  
 Cranmer, Harry C., 217 S. 24th St., Phila., Pa.  
 Detroit Forging Co., Detroit, Mich. (Shifting rails.)  
 Druen, B. D., New Haven, Conn.  
 Fickling & Co., Inc., 304-306 W. 49th St., N. Y. City. (Slat irons & goosenecks.)  
 ★Jonah & George, Merrimac, Mass. (Slat irons.)  
 Non-Corrosive Metal Co., Inc., Watertown, Mass. "Murray." (Phosphor bronze, top slats; separator & liner.)  
 Rands Mfg. Co., 67-69 Fort St., E., Detroit, Mich.  
 Ritter Mfg. Co., 63-69 Amsterdam St., Detroit, Mich.  
 Scherer, H. & Co., Detroit, Mich. (Rails.)  
 ★Smith, Jos. N. & Co., 4th & Porter Sts., Detroit, Mich.  
 Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass. (Slat irons.)

**TOP MATERIALS**

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 Atlantic Leather Co., Wright St. & Ave. A, Newark, N. J. "Keystone." (Patent & enameled leather.)  
 Auto Fabrics Co., Ltd., Thoroughfare Bldg., Broadway, at 57th St., N. Y. City.  
 Bridgeport Patent Leather Mfg. Co., Bridgeport, Conn. "Charter Oak." (Leather.)  
 Caffrey, M. Leather Co., 488 Frelinghuysen Ave., Newark, N. J. (Leather.)  
 ★Carr, F. S. Co., 113 Purchase St., Boston, Mass.  
 ★Chase, L. C. & Co., 89 Franklin St., Boston, Mass. "Chase." (Rubber, leather & mackintosh.)  
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 Fairfield Rubber Co., The, Fairfield, Conn. (Rubber ducks, drills & auto cloths.)  
 Gerhab & Ludlain, 305 Cherry St., Phila., Pa.  
 Haartz, W. A. & J. C., 132 Lincoln St., Boston, Mass. (Textiles, mohair & mackintosh cloths.)  
 Heath, Ed. F. & Son, 225 Warran St., Newark, N. J.  
 Hodgman Rubber Co., 806 Broadway, N. Y. City. "Hodgman."  
 Howell-Hinchman Co., The, Middletown, N. Y. (Patent & enameled leather.)  
 Klauder, Chas. L. Co., B St. & Allegheny Ave., Phila., Pa. "Five Brothers." (Chrome tanned leather.)  
 Laidlaw, William R., Jr., 218 W. 49th St., N. Y. City. "Auto-Leather." (Water-proof imitation leather; mackintosh fabrics, rubber cloth, linings, etc.)  
 Landers Brothers Co., Toledo, O.  
 Lounsbery, G. H. & Sons, 107-109 W. Thrd St., Cincinnati, O. (Imitation leather & top fabrics; imported.)  
 ★Mutt, L. J. Co., 28 Summer St., Boston, Mass. (Mohairs, mackintosh & rubber surface cloths & artificial leather.)  
 O'Bannon Corp., 74 Duane St., N. Y. City. "O'Bannon." (Leather.)  
 ★Pantasote Co., 11 Broadway, New York, N. Y. "Pantasote." (Leather substitute & mackintosh goods.)  
 Parry, A. N. & Co., Amesbury, Mass.  
 Radel Leather Mfg. Co., Hamburg Pl., Newark, N. J. (Leather.)  
 Reilly, P. & Son, Mott & Passaic Aves., Newark, N. J. (Leather.)  
 Rex Imperial Leather Co., 12-28 Chapel St., Newark, N. J. (Leather.)

Roehm & Davison, Ltd., Detroit, Mich.  
 Rogers, E. F. & Co., 410 Arch St., Phila., Pa.  
 Roy Woolen Co., The, Watervliet, N. Y. (Whipcords, bedford cords & broadcloths.)  
 Scherer, H. & Co., Detroit, Mich.  
 Silkman, Chas. R., 111 Duane St., N. Y. City. "Pulviusin." (Imitation leather, imported.)  
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 ★Chase, L. C. & Co., 89 Franklin St., Boston, Mass.  
 Covert's Saddlery Works, Interlaken, N. Y.  
 Cray Bros., 1111-1115 W. 11th St., Cleveland, Ohio.  
 English & Mersick Co., The, 122-26 Winchester Ave., New Haven, Conn.  
 Everitt, The B. F. Co., 506 Clay Ave., Detroit, Mich.  
 Fine Woolen Co., 58 & 60 Worth St., N. Y. City.  
 Fowler Brass Works, Inc., The, 2333 Wabash Ave., Chicago, Ill. (For tops, hoods & radiators.)  
 Gerhab, Jacob, 158-64 N. Third St., Phila., Pa.  
 Gerhab & Ludlain, 305 Cherry St., Phila., Pa.  
 Gifford, Jno. A. & Son, 25 Park Place, N. Y. City.  
 Halsey, J. H. & Smith, Ltd., Newark, N. J. "Oak Leaf." (Leather.)  
 Holliday, W. J. & Co., Indianapolis, Ind.  
 Horstmann, Wm. H. Company, 5th & Cherry Sts., Phila., Pa. "Columbia." (Coach lace, tassels, curtain cords, curtain bands, acorns, frogs, rosettes, silk netted nails, etc.)  
 Indianapolis Dash Co., The, 2116-18 S. Meridian St., Indianapolis, Ind.  
 Indiana Top & Vehicle Co., Lawrenceburg, Ind.  
 Laidlaw, Wm. R., Jr., 218 W. 49th St., N. Y. City.  
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 Merriam, M. H., 72 Lincoln St., Boston, Mass. (Top trimmings, leather binding & gimp.)  
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 Mott, F. & Co., 491 Washington St., Newark, N. J.  
 Neider, F. A. Co., Augusta, Ky.  
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 Perpete Mfg. Co., State & Wall Sts., New Haven, Conn.  
 Quennard, Geo. H., 1777 Broadway, N. Y. City.  
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 Raritan Woolen Mills, 14 White St., N. Y. City.  
 Reilly, John, 40 Avenue C, Newark, N. J. (Leather.)  
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**TRUNKS**

- Abercombie & Fitch Co., 57 Reade St., N. Y. City.  
 A-Z Co., The, 527-9 W. 56th St., N. Y. City.  
 ★Ajax Trunk & Sample Case Co., 91-93 Mercer St., N. Y. City. "Ajax." (Auto & tire.)  
 Automobile Apparel Co., 14 W. 22nd St., N. Y. City.  
 Auto Trunk Mfg. Co., The, 39 Beekman St., N. Y. City.  
 Boyle, John & Co., 112-14 Duane St., N. Y. City.  
 Burlington Basket Mfg. Co., Burlington, Ia. "Hawkeye." (Willow.)  
 Duane, W. J. & Co., 230 W. 58th St., N. Y. City.  
 Fuller, The G. W. Co., 182 Asylum St., Hartford, Conn. "The Fuller." (Also tire trunks, lunch & picnic cases.)  
 Goldsmith, L. & Son, Cherry & Canal Sts., Newark, N. J. "G & S."  
 Haskell Bros., Wabash Ave. & Washington St., Chicago, Ill.  
 Kamlee Co., The, 339 Milwaukee St., Milwaukee, Wis. "Kamlee."  
 King, W. A., 52 Public Square, Cleveland, O. "King's." (Tire.)  
 Lynch Mfg. Co., Madison, Wis.  
 Morrison, L. E. & Co., 27 W. Washington St., Indianapolis, Ind. "Morrison."  
 Murray, Joseph, Newton, Mass. "Murray." (Round tire boxes.)  
 ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan." (Auto and tire.)  
 National Veneer Products Co., Mishawaka, Ind. "Indestructo."  
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 Planet Co., The, Westfield, Mass. "Duplex." (Folding.)  
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 Fleckling & Co, Inc., 304-306 W. 49th St., N. Y. City.  
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 Lund Smith Co., The, 51 Godwin St., Pater-son, N. J.  
 Lynch Mfg. Co., Madison, Wis.  
 ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill. "Cradle."  
 Noonon Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.  
 Pollard Auto Co., 232 Main St., Nashua, N. H.  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. "Aremco."  
 Schlegel Mfg. Co., 27 Canal St., Rochester, N. Y.  
 Stanhope Forge & Machine Works, 27 Stanhope St., Boston, Mass.  
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 Victor Clutch Compound Co., Nashua, N. H. "Victor."  
 Vogt Mfg. & Coach Lace Co., Rochester, N. Y. (And hat carriers.)  
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 Williams, C. L., 312 Halsey St., Newark, N. J.  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Wilson."  
 ★Winship, W. W., 71 Summer St., Boston, Mass.

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 American Metal Hose Co., 173-77 Lafayette St., N. Y. City. "Ametalhose" & "Nyflexmet." (Metal.)

- Automobile Supply Mfg. Co., 224 Taaffe Pl., Brooklyn, N. Y. (Brass & steel.)  
 Kaufman, The A. G. Mfg. Co., Inc., 131-33 Reade St., N. Y. City. (Metallic.)  
 ★Nonpareil Horn Mfg. Co., 139-147 Emerson Place, Brooklyn, N. Y.  
 Pennsylvania Flexible Metallic Tubing Co., 1305 Arch St., Phila., Pa. (For oil, gasoline & exhaust bends.)  
 Riley-Klotz Mfg. Co., 17-19 Mulberry St., Newark, N. J. (Horn.)  
 Schoen-Jackson Co., Media, Pa. (Metallic.)  
 Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J. "Standard." (Horn & speedometer.)  
 Stevens & Co., 375 Broadway, N. Y. City. (Horn.)  
 U. S. Flexible Metallic Tubing Co., 450 E. 3rd St., Los Angeles, Cal. (Metallic.)

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 ★Bridgeport Brass Co., Cor. Fairfield & Holland Aves., Bridgeport, Conn.  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 Buffalo Copper & Brass Rolling Mill, Military Rd., Buffalo, N. Y. (Brazed brass.)  
 ★Buffalo Tube Co., 257 Rano St., Buffalo, N. Y. (Seamless brass, copper & German silver.)  
 ★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (Copper.)  
 Dallas, A. C. & Son, Inc., 163 Randolph St., Chicago, Ill.  
 Delaware Seamless Tube Co., Auburn, Pa. (Steel.)  
 Detroit Seamless Steel Tubes Co., 804 Union Trust Bldg., Detroit, Mich. (Also motorcycle cylinders.)  
 French Mfg. Co., The, 136 Robbins St., Waterbury, Conn. (Seamless copper, brass, bronze & white metal.)  
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star." (Brass & copper.)  
 Indestructibile Metal Co., 50 Church St., N. Y. City. "Indestructibile."  
 Ivins, Ellwood, Tube Works, Oak Lane Station, Phila., Pa. (Seamless steel, brass, copper & aluminum.)  
 McKenna Bros. Brass Co., First Ave. & Ross St., Pittsburg, Pa. (Brass & copper.)  
 Mackenzie-Walton Co., The, Pawtucket, R. I. (Seamless brass and copper.)  
 ★Merchant & Evans Co., 517 Arch St., Phila., Pa. "Star." (Brass & copper.)  
 Michigan Copper & Brass Co., Detroit, Mich. "Wolverine." (Brass.)  
 ★National Tube Co., Frick Bldg., Pittsburg, Pa. "Shelby." (Seamless steel.)  
 Ohio Blower Co., The, 324-32 Prospect Ave., N. W., Cleveland, Ohio. (Brazed & bent.)  
 Ohio Seamless Tube Co., The, Shelby, Ohio. "Ohio Special."  
 Phenix Tube Co., 182 N. 11th St., Brooklyn, N. Y. "Phenix." (Iron lined brass & bronze tubes; brazed steel tubing.)  
 Pittsburgh Steel Products Co., Frick Bldg., Pittsburg, Pa. (Seamless.)  
 Randolph-Clowes Co., The, Waterbury, Conn. (Brass & copper.)  
 Reading Iron Co., Reading, Pa.  
 Rome-Turney Radiator Co., Rome, N. Y. "Rome." (Spiral.)  
 Rome Brass & Copper Co., Rome, N. Y. "Rome Quality." (Seamless & brazed brass & copper.)

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- Rutter, Arthur T. & Co., 256 Broadway, N. Y. City. (Seamless brass & copper.)  
 Slade Tubing Co., Rome, N. Y. (Seamless brass & copper.)  
 ★Standard Welding Co., The, 76th St., N. W. & L. S. & M. S. R. R., Cleveland, Ohio. (Seamless frame & handle bar.)  
 Tube Bending Machine Co., 148-150 Mulberry St., Newark, N. J.  
 Uniform Seamless Wire Co., 71 Peck St., Providence, R. I. (Copper & brass.)  
 United Wire & Supply Co., 109 Summer St., Providence, R. I.  
 ★Ward, Edgar T. & Sons, 23-25 Purchase St., Boston, Mass. (Seamless steel.)  
 Waterbury Mfg. Co., Waterbury, Conn. (Brazed brass.)  
 Wells, A. H. & Co., Waterbury, Conn. (Brass & seamless copper.)

**TUBING, Soft Rubber**

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 Cincinnati Rubber Mfg. Co., The, Cincinnati, Ohio.  
 Combination Rubber Mfg. Co., Bloomfield, N. J.  
 Continental Rubber Works, Erie, Pa.  
 ★Diamond Rubber Co., Akron, O.  
 ★Goodrich, B. F. Co., Akron, O. (Lamp connections & pump tubes.)  
 Lee, J. Ellwood Co., Conshohocken, Pa.  
 Mattson Rubber Co., Lodi, N. J. (Lamp connections & generator tubing.)  
 Mechanical Rubber Co., C. & P. R. R., near Nickel Plate R. R., Cleveland, Ohio. "Cleveland."  
 ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I. "TYXs." (Lamp connections.)  
 ★Morgan & Wright, Foot of Bellevue St., Detroit, Mich. "M. & W."  
 New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.  
 Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y. "Alpha." (Lamp.)  
 Pennsylvania Rubber Co., Jeannette, Pa.  
 ★Prest-O-Lite Co., The, 229-237 E. South St., Indianapolis, Ind. "Prest-O-Lite."  
 Seamless Rubber Co., New Haven, Conn. (Lamp connections & generator tubing.)  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's." (Lamp connections.)  
 ★Thermoid Rubber Co., Trenton, N. J. (Lamp connections.)  
 Tingley, Chas. O. & Co., Rahway, N. J. (Lamp connections.)  
 Wilkie Rubber Mfg. Co., Lynn, Mass.  
 United & Globe Rubber Mfg. Co., Trenton, N. J.

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(See Upholstery Buttons.)

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- Detroit Screw Works, Detroit, Mich.  
 Haskell, Wm. H. Mfg. Co., 451 Main St., Pawtucket, R. I.  
 Hoopes & Townsend Co., 1330 Buttonwood St., Phila., Pa.  
 Merrill Bros., Maspeth, N. Y.  
 Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.  
 Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich.

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 ★Eclipse Machine Co., Elmira, N. Y. "Eclipse."  
 Keller & Risque Motor Co., The, 20 W. 3rd St., St. Paul, Minn. "K & R." (Also free engine clutch.)  
 Lang, C. H., 35 East Adams St., Chicago, Ill. ("Langs"; also "Langs" friction clutches.)  
 ★N. S. U. Motor Co., 206 West 76th St., N. Y. City. "N.S.U." (Also free engine clutches.)  
 Prospect Motor Co., 1900 Broadway, N. Y. City. "Simplex."  
 ★Reliance Motor Cycle Co., Owego, N. Y.

**UNDER BONNETS**

(See Dust &amp; Mud Shields.)

**UNDERWATER EXHAUSTS**

- Cavito Underwater Exhaust Co., Louis & Otawa Sts., Grand Rapids, Mich. "Cavito."  
 Ferro Machine & Foundry Co., The, 115 Wade Bldg., Cleveland, O.  
 Kaufmann, Chas., 28 Main St., Oshkosh, Wis.  
 Mechanical Devices Co., Inc., Watervliet, N. Y. "Indispensable." (Reversible.)  
 Motor Mfg. Works Co., The, Ft. of Middle St., Geneva, N. Y. "Reid Rational."  
 Sellow, B. A., 756 Main St., Hartford, Conn. "Hartford."  
 Truscott Boat Mfg. Co., St. Joseph, Mich. "Trusco."

**UNIONS**

(See Pipe Fittings.)

**UNIVERSAL JOINTS**

- ★Acme Universal Joint & Mfg. Co., 310-14 E. Water St., Kalamazoo, Mich. "Acme Simplex."  
 Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 Auto Parts Mfg. Co., South Elliot St. & T. E. W. R., Muncie, Ind. "B.T.K."  
 ★Blood Bros. Machine Co., 633 W. Ransom St., Kalamazoo, Mich. "Blood."  
 ★Boston Gear Works, Norfolk Downs, Mass.  
 Covert Motor Vehicle Co., Lockport, N. Y. "Covert."

# BLOOD BROS. UNIVERSAL JOINTS



**Style J, Double**

¶ Adapted for use between engine and transmission. We have many other patterns, both single and double.

**Blood Bros. Machine Co.**  
Kalamazoo, Michigan

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**UNIVERSAL JOINTS—Continued**

- Fetzger Automobile Mfg. Co., Columbus & Walnut Sts., Galion, O. "Fetzger."
- ★General Mfg. Co., The, Elkhart, Ind.
- Gerome, T. F., 130-32 W. 18th St., N. Y. City. "Perfection."
- Gray & Prior Machine Co., 90 Suffield St., Hartford, Conn.
- Hartford Automobile Parts Co., 80 Huyshope Ave., Hartford, Conn. "Hartford."
- Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.
- Kinsler-Bennett Co., The, 62 Market St., Hartford, Conn. "K-B."
- Lehman, I., 2187 E. 2nd St., Cleveland, O.
- ★Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.
- Lockwood Ash Motor Co., Jackson, Mich.
- Mechanical Devices Co., Inc., Watervliet, N. Y. "Indispensable." (Flexible couplings.)
- Michigan Wheel Co., Canal & LeGrande Sts., Grand Rapids, Mich.
- ★Model Gas Engine Works, Peru, Ind.
- Mutual Machine Co., The, 25 Wells St., Hartford, Conn. "Warren" & "Mutual."
- National Equipment Co., Springfield, Mass.
- Roper, C. F. & Co., Hopedale, Mass. (Safety couplings.)
- Spade Bros., Vicksburg, Mich.
- Spicer Universal Joint Mfg. Co., Madison Ave. & West 3rd St., Plainfield, N. J. "Spicer."
- Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn. "Giant."
- ★Widmer Machine Works, Inc., 292-94 E. 135th St., N. Y. City.

**UPHOLSTERING**

(See Body Finishing.)

**UPHOLSTERY BUTTONS, TACKS, ETC.**

- Cincinnati Cloth Button Co., 120 Government Pl., Cincinnati, Ohio.
- Crandal, Stone & Co., Binghamton, N. Y. "Pioneer."
- Detroit Wire Spring Co., 21st & Standish Sts., Detroit, Mich. (Ventilating buttons.)
- Grand Crossing Tack Co., Grand Crossing, Chicago, Ill. (Tacks.)
- Higgin Mfg. Co., Newport, Ky.
- Lounsbury, G. H. & Sons, 107-109 W. Third St., Cincinnati, O. (Imported.)
- Neider, F. A. Co., Augusta, Ky.
- New Haven Button Co., 161 Brewery St., New Haven, Conn.
- Reade, Chas. W., 103 Court St., New Haven, Conn. (Buttons & nails.)
- Tockwotton Co., 79 S. Main St., Providence, R. I. "Grip Shank." (Upholstery buttons) & "Anchor" (nails.)

**UPHOLSTERY MATERIALS**

- Atlantic Leather Co., Wright St. & Ave. A., Newark, N. J. "Keystone." (Patent and enameled leather.)
- Auto Fabrics Co., Ltd., Thoroughfare Bldg., Broadway, at 57th St., N. Y. City.
- Carr, F. S. Co., 113 Purchase St., Boston, Mass. (Imported.)
- Chandler Oil Cloth & Buckram Co., East Taunton, Mass. (Enamel oil cloths, oil ducks & buckrams.)
- ★Chase, L. C. & Co., 89 Franklin St., Boston, Mass. "Chase." (Leather, imitation leather & slip cover materials.)

- Cocheco Woolen Mfg. Co., E. Rochester, N. H. (Broadcloths, homespun, cassimeres, thibet cloths, suiting & flannels.)
- ★Cowles, C. & Co., Water & Chestnut Sts., New Haven, Conn. "Star" & "Eagle" (webbing); "Eureka" & "C. C. & Co." (wadding.)
- Cranska Thread Co., Worcester, Mass. "Cranska." (Thread.)
- Dusenbury, Louis & Co., Inc., 79-81 Worth St., N. Y. City.
- Fairfield Rubber Co., The, Fairfield, Conn. (Rubber ducks, drills & auto cloths.)
- Fogg, M. W., 202 Front St., N. Y. City.
- Gordon Bros., Inc., Pierce & Orthodox Sts., Phila., Pa. (Hair cloth.)
- Haartz, W. A. & J. C., 132 Lincoln St., Boston, Mass. (Textiles, mohair & mackintosh cloths.)
- Holliday, W. J. & Co., Indianapolis, Ind. (Mohairs.)
- Laidlaw, Wm. R., Jr., 218 W. 49th St., N. Y. City. "Auto-Leather." (Waterproof imitation leather, mackintosh fabrics, rubber cloths, linings, etc.)
- Landers Bros. Co., Toledo, O.
- Meyers, John C. & Co., Lowell, Mass. "Meyers Hub Sewing Thread," "Meyers Diamond Spool Silk," "Meyers Never Rip Tufting Twine," "Meyers Spool Cotton" and "Lowell Linen Thread."
- Michigan Veneer Co., Alpena, Mich. (Wood wool & excelsior.)
- O'Bannon Corp., 74 Duane St., N. Y. City. "O'Bannon." (Leather.)
- ★Pantasote Co., 11 Broadway, N. Y. City. "Pantasote." (Leather substitute & mackintosh goods for slip covers.)
- Radel Leather Mfg. Co., Hamburg Place, Newark, N. J. (Leather.)
- Raritan Woolen Mills, 14 White St., N. Y. City. (Whipcords.)
- Roy Woolen Co., The, Watervliet, N. Y. (Whipcords, bedford cords & broadcloths.)
- Schlegel Mfg. Co., 27 Canal St., Rochester, N. Y. (Coach lace.)
- Silkman, Chas. R., 111 Duane St., N. Y. City. "Pluviusin." (Imitation leather, imported.)
- Standard Oil Cloth Co., 320 Broadway, N. Y. City. "Meritas." (Upholstering drills, ducks & leather cloth.)
- Stengel & Rothschild, Main & Kossuth Sts., Newark, N. J. (Leather.)
- Straus, M. & Sons, Frelinghuysen Ave., Newark, N. J. "Beaver." (Leather.)
- Summit Thread Co., East Hampton, Conn. (Top & upholstery thread.)
- Tufting Machine Supply Co., 1200 Michigan Ave., Chicago, Ill. (Buttons, washers & tufting machine supplies.)
- Waterloo Woolen Co., Waterloo, N. Y.

**VACUUM BOTTLES**

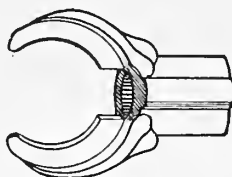
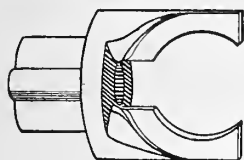
- American Ever Ready Co., 304-322 Hudson St., N. Y. City. "Eveready."
- American Thermos Bottle Co., Brooklyn, N. Y. (Thermos bottles.)
- Caloris Mfg. Co., 2118 W. Allegheny Ave., Phila., Pa. "Caloris."
- Icy Hot Bottle Co., The, 216-218 Longworth St., Cincinnati, Ohio. "Icy-Hot." (Also jars.)
- Janus Vacuum Goods Co., 10 Beach St., N. Y. City. "Janus."
- MacDonald & Campbell, 1334-36 Chestnut St., Phila., Pa.
- New Idea Sales Co., The, Corning, N. Y. "New Idea." (Heat retaining.)

★ indicates Advertisers—see Index in back of book.



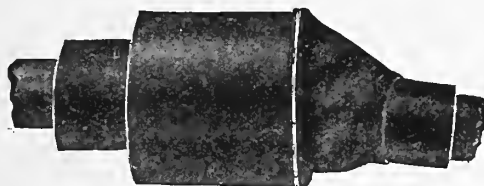
# UNIVERSAL JOINTS

## ACME      SIMPLEX



Couplings designed to meet your requirements. Single or double, to transmit any power desired.

Only 3  
Wearing  
Parts



Guaranteed  
against any  
defect in  
workmanship  
or material

## Acme Universal Joint Manufacturing Co.

KALAMAZOO, MICH.

### VACUUM CLEANERS

- New Idea Sales Co., The, Corning, N. Y. "Peerless."  
Palm Engineering Co., The, 34-36 Bates St., Detroit, Mich. "Palm."

### VALVES, Engine

- Ashton Valve Co., 271 Franklin St., Boston, Mass. "Ashton." (Pop safety valves.)  
★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. (Check.)  
★Chescent Forgings Co., Oakmont, Pa.  
Heitger Carburetor Co., 205½-207½ W. South St., Indianapolis, Ind. (Check.)  
Hickey Foundry Co., 345 Elliott Sq., Buffalo, N. Y.  
Lewis Electrical Welding & Mfg. Co., 234 Cherry St., Toledo, O. (Drop forged, electrically welded.)  
★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I. "Morgan."  
National Welding & Mfg. Co., 1422-30 Niagara St., Buffalo, N. Y. (Cast iron & steel poppet valves.)  
Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.  
★Ohio Brass Co., Mansfield, Ohio. "Ohio." (To order.)  
★Standard Welding Co., The, 76th St. N. W. & L. S. & M. S. R. R., Cleveland, O.  
Western Automatic Machine Screw Co., Elyria, O. (Poppet.)

### VALVES, Miscellaneous

- American Steam Gauge & Valve Mfg. Co., 220 Camden St., Boston, Mass.

- Bashlin Co., Warren, Pa. (Air.)  
Belfield, H. & Co., 435 N. Broad St., Phila., Pa.  
★Breeze Carburetor Co., 240 South St., Newark, N. J. "Breeze." (Check valves.)  
Brown Co., The, 1071-3 S. Clinton St., Syracuse, N. Y. (Whistling outfit and vulcanizing pop or safety.)  
Buckeye Iron & Brass Works, 324 E. Third St., Dayton, Ohio. (Needle.)  
Chambersburg Engineering Co., Chambersburg, Pa. (Valve & fittings for high pressures.)  
Crane Co., 1214 S. Canal St., Chicago, Ill. (Globe, check & needle.)  
Eastwood Wire Mfg. Co., Belleville, N. J.  
★Essex, G. B. Brass Co., 480-486 Franklin St., Detroit, Mich.  
General Drop Forge Co., 1733 Elmwood Ave., Buffalo, N. Y. (Drop forged.)  
Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y. "James." (Check.)  
Gleason-Peters Air Pump Co., 255-261 Clarkson Ave., Brooklyn, N. Y. "G-P." (Air.)  
Hall Mfg. Co., John & Gold Sts., N. Y. City. "Atlas." (Reducing valves.)  
Haydenville Co., Haydenville, Mass.  
★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill. (Gasoline pressure feed.)  
Jenkins Bros., 71 John St., N. Y. City. "Jenkins."  
Kennedy Valve Mfg. Co., Elmira, N. Y.  
Kinsey & Mahler Co., Peoria, Ill. (Brass globe, angle & check.)  
Lavigne Mfg. Co., Commonwealth Ave. & Railroad, Detroit, Mich. "Lavigne."  
★Liggett Spring & Axle Co., Park Bldg., Pittsburg, Pa. (Check.)  
Locke Regulator Co., Salem, Mass. (Automatic pressure regulating.)

★ indicates Advertisers—see Index in back of book.

**VALVES, Miscellaneous—Continued**

- Lonergan, J. E. Co., 211-13 Race St., Phila., Pa. (Pop safety.)
- ★Lunkenheimer Co., The, Cincinnati, Ohio. "Renewo," "Clip," "Victor," "Samson" & "Handy."
- Michigan Lubricator Co., 661-671 Beaubien St., Detroit, Mich. (Check.)
- Milwaukee Valve Co., 871-81 Robinson Ave., Milwaukee, Wis.
- Monarch Valve Co., 112 Front St., Brooklyn, N. Y. (Check.)
- ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I. "Morgan." (Check.)
- ★National Tube Co., Frick Bldg., Pittsburg, Pa. "High-Duty-Metal."
- ★Ohio Brass Co., Mansfield, O. "Ohio." (To order.)
- Pittsburg Gage & Supply Co., 30th & Liberty Sts., Pittsburg, Pa. "Pittsburgh."
- ★Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.
- Stephens, Roe, Mfg. Co., Detroit, Mich.
- Thomas Brass & Iron Co., Waukegan, Ill.
- U. S. Indestructible Gasket Co., 50 Church St., N. Y. City. (Metallic pump.)
- Universal Wind Shield Co., 130-134 S. Clinton St., Chicago, Ill. "Universal." (Chime valves.)
- Westinghouse Air Brake Co., Pittsburg, Pa. (Check, for compressed air tank, safety valves & pressure reducing valves for air compressors.)

**VALVES, Mixing**

(See Mixing Valves, Generator Valves & Vaporizers.)

**VALVES, Muffler cut-out**

(See Muffler Cut-Outs.)

**VALVES, Tire**

(See Tire Valves.)

**VALVE GRINDING COMPOUNDS**

- Auto Equipment Co., 32 Hollywood Ave., E. Orange, N. J. "Eureka."
- Bornschein, J. F. & Co., 2351 Indiana Ave., Chicago, Ill. "E-Z," "Peerless" & "X-L."
- Carborundum Co., The, Niagara Falls, N. Y. (Carborundum.)
- ★Clover Mfg. Co., 151 E. 126th St., N. Y. City. "Clover."
- Diamond Pulvs Co., 1331 Intervale Ave., N. Y. City. "Diamond Pulvs."
- Hezinger Bros., 202 E. 74th St., N. Y. City. "New York."
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.
- Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."
- ★Victor Auto Supply Mfg. Co., 42 W. 43rd St., N. Y. City. "Vasco."

**VALVE STEMS, Engine**

- Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
- Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, O.

- ★Crescent Forgings Co., Oakmont, Pa.
- Electric Welding Products Co., Cleveland, O.
- Machine Accessories & Novelties Mfg. Co., 257 W. Exchange St., Providence, R. I. (Valve lifts.)
- Orford Copper Co., The, 43 Exchange Place, N. Y. City. "Monel Metal."
- ★Standard Connecting Rod Co., Beaver Falls, Pa.

**VANADIUM STEEL**

(See Raw & Semi-Finished Material.)

**VAPORIZERS**

(See Mixing Valves, Generator Valves & Vaporizers.)

**VARNISHES**

- Acme White Lead & Color Works, Detroit, Mich. "Ti-Ki."
- Akron Varnish Co., Akron, O. "Akron."
- American Varnish Co., 1140 N. Branch St., Chicago, Ill. "White."
- Beckwith-Chandler Co., 320 Fifth Ave., N. Y. City.
- Berry Bros., Ltd., Leib & Wight Sts., Detroit, Mich.
- Billings-Chapin Co., Cleveland, O.
- Binswanger, B. & Co., 115 N. 4th St., Phila., Pa.
- Boston Varnish Co., Everett, Mass. (And japans.)
- Brooks, Clarence & Co., 249-77 Chestnut St., Newark, N. J.
- Buffalo Enamel & Stain Co., Lord, Clinton & James Sts., Buffalo, N. Y. "True."
- Carpenter Morton Co., Boston, Mass. "Campbell's." (Motor boat.)
- Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y. "Kismet."
- Chicago Varnish Co., 2100 Elston Ave., Chicago, Ill.
- ★Cincinnati Color Co., 8th, Evans & Whately Sts., Cincinnati, O. "Cincinnati."
- Cleveland Varnish Co., 3111 E. 87th St., Cleveland, O. ("Freiastic" auto; also baking & drying japans; "Cleveland" boat & motorcycle.)
- Columbus Varnish Co., Columbus, O.
- Crockett, The David B. Co., Bridgeport, Conn. (Spar composition.)
- Detroit Varnish Co., Detroit, Mich. "Roger's Red Seal."
- Devoe, F. W. & C. T. Reynolds Co., Fulton & Williams St., N. Y. City. "Vernosite." (Spar.)
- Ditzler Color Co., 18-24 Baltimore St., West, Detroit, Mich.
- Elmendorf Varnish Co., 841-45 Larrabee St., Chicago, Ill. "Elmendorf."
- Essex Varnish Co., 92 Vesey St., Newark, N. J.
- Felton, Sibley & Co., 136-140 N. 4th St., Phila., Pa. "F-S."
- Flint Varnish Works, Flint, Mich.
- Flood & Conklin Co., Newark, N. J. (And japans.)
- Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, O. "Forest City."

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# How to Save Money

on your

## Motor Car Varnishing

MURPHY PALEST MOTOR CAR BODY is the Finishing Varnish that endures mud and grit enough longer to make it cheaper than cheaper varnish would be as a gift.

MURPHY MOTOR CAR PRIMER and SURFACER give the varnish basis that is undisturbed by the most racking vibrations.

MURPHY MOTOR CAR COLORS, made of best natural pigments, perfectly ground, are above criticism.

Let us send you our elegant FREE booklet

***"The Murphy System of Motor Car Finishing"***

Please address us carefully at 228 McWhorter St., Newark, N. J.

**Murphy Varnish Company,** FRANKLIN MURPHY, President  
Newark Boston Cleveland St. Louis Chicago

## The Varnish That Lasts Longest

Associated with Dougall Varnish Company, Limited, Montreal, Canada

**VARNISHES—Continued**

- French, Samuel H. & Co., Fourth & Callowhill Sts., Phila., Pa.  
 Glidden Varnish Co., Cleveland, O.  
 Harland, William & Son, Genesee St. & Erie Canal, Buffalo, N. Y. (English & domestic.)  
 Heath & Milligan Mfg. Co., 170-72 Randolph St., Chicago, Ill. "Superfine." (And japans.)  
 Hildreth Varnish Co., 90 West St., N. Y. City.  
 Holland Enamel & Paint Co., 142 Fulton St., N. Y. City. (Stains.)  
 Hotopp Varnish Co., First & Marshall Sts., Hoboken, N. J. "Dura."  
 Lowe Bros. Co., The, Dayton, Ohio. "Little Blue Flag."  
 Lucas, John & Co., Phila., Pa. "Lucas."  
 McDougall Varnish Co., Buffalo, N. Y.  
 Masury, John W. & Son, 44 Jay St., Brooklyn, N. Y.  
 Mitchell Varnish Works, 317-19 N. J. R. R. Ave., Newark, N. J.  
 Moller & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y. "Hilo."  
 ★Murphy Varnish Co., Chestnut & McWhorter Sts., Newark, N. J. (Auto & marine.)  
 National Varnish & Color Co., 85-91 Vesey St., Newark, N. J. "Hopkins."  
 Nice, Eugene E., 272 S. Second St., Phila., Pa. ("Yellow Seal"; also "Albany" japans & shellacs.)  
 ★Parrott Varnish Co., Bridgeport, Conn. ("Parrott," auto & motor boat; also spar varnish.)  
 Payson Varnish Co. 141st St. & Walnut Ave., N. Y. City.  
 Pomeroy & Fischer, 28 & 30 Frankfort St., N. Y. City. (Imported.)  
 Pratt & Lambert, Inc., Buffalo, N. Y.  
 Schrack, C. & Co., 152-58 N. 4th St., Phila., Pa. (Also spar varnish.)  
 Smith, Edward & Co., 129 West Ave., Long Island City, N. Y. ("I.X.L." & "Smith's"; also "Smith's" spar coating.)  
 Standard Varnish Works, 29 Broadway, N. Y. City. (Also japans.)  
 Stewart-Mowry Co., 3214 Shields Ave., Chicago, Ill. "Gold Cross."  
 Tingley, Chas. O. & Co., Rahway, N. J. (japan varnish for engines and mufflers.)  
 ★Valentine & Company, 257 Broadway, N. Y. City. Also 277 Dearborn St., Chicago, Ill. "Valentine" & "Vanadium"; "Valspar." (Spar varnish.)  
 Wadsworth-Howland Co., 84 Wash St., Boston, Mass. "W. H. & Co."  
 Wheeler-Clough Co., 246-264 E. Illinois St., Chicago, Ill. (Also japans.)  
 Willey, C. A. Co., Hunters Point, N. Y. City.  
 Woolsey, C. A. Paint & Color Co., Jersey City, N. J. (Marine.)

**VARNISH REMOVERS**

- Adams & Elting Co., 159-163 Washington Blvd., Chicago, Ill. "Ad-el-ite."  
 Century Novelty Co., 241 Jefferson Ave., W., Detroit, Mich. "Hatt."  
 ★Parrott Varnish Co., Bridgeport, Conn.

**VEHICLE MOTION RECORDERS**

(See Recorders, Vehicle.)

**VOLT-AMMETERS**

- American Ever Ready Co., 304-22 Hudson St., N. Y. City. "Eveready." (Pocket.)  
 ★Atwater-Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa. "Kent."  
 Clark Electric Meter Co., 141-3 S. Clinton St., Chicago, Ill.  
 Connecticut Telephone & Electric Co., The, 50 Britannia St., Meriden, Conn. "Connecticut."  
 Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."  
 Eldredge Electric Mfg. Co., 3 Post Office Sq., Springfield, Mass. "Advance." (Pocket.)  
 Excel Instrument Co., 1555 E. 65th St., Cleveland, O. "Excel."  
 Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."  
 Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Hine-Watt."  
 ★Hoyt Electrical Instrument Works, Penacook, N. H. "Hoyt Tribune."  
 International Electric Meter Co., 330 W. Randolph St., Chicago, Ill.  
 Motor Car Equipment Co., The, 55 Warren St., N. Y. City. (Imported.)  
 ★Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss."  
 Pignolet, L. M., 78 Cortlandt St., N. Y. City.  
 Read-Rite Meter Works, 14 Main St., Bluffton, O. "Read-Rite."  
 Reliance Instrument Co., 527 W. Van Buren St., Chicago, Ill. "Reliance."  
 Robert Instrument Co., The, 56 Shelby St., Detroit, Mich. "Robert." (Pocket.)  
 Roller-Smith Co., 203 Broadway, N. Y. City. "Roller Smith."  
 Sterling Mfg. Co., The, 416 American Trust Bldg., Cleveland, O.

**VOLTMETERS, Pocket**

- American Ever Ready Co., 304-322 Hudson St., N. Y. City. "Eveready."  
 Clark Electric Meter Co., 141-43 S. Clinton St., Chicago, Ill.  
 Connecticut Telephone & Electric Co., 50 Britannia St., Meriden, Conn. "Connecticut."  
 Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."  
 Eldredge Electric Mfg. Co., 3 Post Office Sq., Springfield, Mass. "Advance."  
 Excel Instrument Co., 1555 E. 65th St., Cleveland, O. "Excel."  
 Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I. "Goodson."  
 Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill. "Hine-Watt."  
 ★Hoyt Electrical Instrument Works, Penacook, N. H. "Hoyt."  
 International Electric Meter Co., 330 W. Randolph St., Chicago, Ill.  
 Miller, Chas. E., 97-101 Reade St., N. Y. City. "Diamond M."  
 National Carbon Co., Lock Drawer L, Cleveland, O. "Columbia."  
 ★Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss."  
 Pignolet, L. M., 78 Cortlandt St., N. Y. City.  
 Post & Lester Co., The, 20 Sargeant St., Hartford, Conn. "Accuro."  
 Read-Rite Meter Works, 14 Main St., Bluffton, Ohio. "Read-Rite."  
 Reliance Instrument Co., 527 W. Van Buren St., Chicago, Ill. "Reliance."  
 Robert Instrument Co., The, 56 Shelby St., Detroit, Mich. "Robert."  
 Roller-Smith Co., 203 Broadway, N. Y. City. "Roller Smith."  
 Smith, C. J. & Co., St. Paul, Minn. "Cisco."  
 Stackpole Battery Co., St. Marys, Pa.  
 Sterling Mfg. Co., The, 416 American Trust Bldg., Cleveland, O.  
 Wagner Electric Mfg. Co., 6400 Plymouth Ave., St. Louis, Mo.  
 Witherbee Igniter Co., Springfield, Mass. "Witherbee."

# 3/4

of the motor cars exhibited at the

## CHICAGO AUTOMOBILE SHOW

February 5-12, 1910

237 cars out of 319 cars exhibited were finished with

# VALENTINISHES

## VALENTINE & COMPANY

New York Chicago Boston Paris Amsterdam

### VULCANIZING MATERIALS

- Continental Rubber Works, Erie, Pa.
- ★Goodyear Tire & Rubber Co., Akron, O.
- Rice & Dayton Mfg. Co., Cedar Falls, Ia.
- Seamless Rubber Co., New Haven, Conn.
- (Raw stock & fabrics.)
- Voorhees Rubber Mfg. Co., Jersey City, N. J.

### VULCANIZING SOLUTION

- Brooklyn Rubber Co., 397-401 Summer Ave., Brooklyn, N. Y. "Clingfaste."
- ★Goodrich, B. F. Co., Akron, O.
- ★Goodyear Tire & Rubber Co., Akron, O.
- Hazen-Brown Co., 100 South St., Boston, Mass. "Vulcanoid."
- ★M. & M. Mfg. Co., Akron, O. "M. & M."
- O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil."
- Parks, F. B. Co., 173-175 Prescott St., Grand Rapids, Mich. "Parks."
- ★Peerless Cement Co., The, 39 Viaduct, Akron, Ohio. "Peerless."
- Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's."
- Tingley, Chas. O. & Co., Rahway, N. J. "C. O. T."

**WARMERS, Foot**  
(See Heaters.)

### WASH APRONS

- ★Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City. "Nathan."
- Waterproof Garment Co., 3 E. 14th St., N. Y. City. (Waterproof.)

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**Parrott**  
**Varnish**  
**Company**

Manufacturers of the Highest Grade

## Automobile Varnishes

and the best Varnish Remover  
on the market.

**BRIDGEPORT, CONN.**

**WASHERS, Felt**

- ★Booth, N. E., 644 Pacific St., Brooklyn, N. Y.  
(Also oil & dust rings.)
- ★Bowen Mfg. Co., Mechanic St., Auburn, N. Y.
- ★Braunsderf, Geo. W., 305 E. 43rd St., N. Y. City.
- Climax Specialty Co., Seneca Falls, N. Y.
- Hoffeld, R. & Co., Buffalo, N. Y.
- House, Chas. W. & Sons, Unionville, Conn.
- Sutherland, F. L. Co., Detroit, Mich.
- Tingue, Brown & Co., 64 Reade St., N. Y. City.  
"Tibrode Brand."
- U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.

**WASHERS, Flexible (Packing)**

- American Vulcanized Fibre Co., 500 Equitable Bldg., Wilmington, Del. (Fibre.)
- ★Bowen Mfg. Co., Mechanic St., Auburn, N. Y. (Leather.)
- Climax Specialty Co., Seneca Falls, N. Y. (Leather, rubber & paper.)
- Continental Fibre Co., Newark, Delaware. (Fibre.)
- Continental Rubber Works, Erie, Pa. (Rubber.)
- Delaware Hard Fibre Co., Wilmington, Del. (Hard fibre.)
- Detroit Leather Works, 844 Woodward Ave., Detroit, Mich. (Leather.)
- Fitzgerald Mfg. Co., 208 N. Elm St., Torrington, Conn. (Copper asbestos.)
- Gasket Supply Co., The, 1729 Ludlow St., Phila., Pa. (Leather & felt.)
- Goodwin & Kintz Co., Winsted, Conn.
- Hoffeld, R. & Co., Buffalo, N. Y. (Leather.)
- Hoopes & Townsend Co., 1330 Buttonwood St., Phila., Pa. (Wood.)
- Jewell Belting Co., 53 Trumbull St., Hartford, Conn. (Leather.)
- Quride Co., 1417 N. Salina St., Syracuse, N. Y. "Quride."
- Royal Fibre Co., West Somerville, Mass. (Hard fibre.)
- ★Thermoid Rubber Co., Trenton, N. J. (Rubber.)
- U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.
- Wolverine Leather Goods Co., 51-59 Fort St., East, Detroit, Mich. (Leather; also valve & plunger leathers.)

**WASHERS, Lock**

(See Lock Nuts and Washers.)

**WASHERS, Metal**

- American Iron & Steel Mfg. Co., Lebanon, Pa. (Iron & steel.)
- Avery Stamping Co., The, Cleveland, Ohio. "Never-Break."
- Bay State Screw Co., Hatfield, Mass.
- Bettcher Mfg. Co., Cleveland, O. (Brass, steel & iron.)
- Border Bolt & Nut Lock Co., Richmond, Ind.
- Clark Bros. Bolt Co., Milldale, Conn.
- Columbus Bolt Works, 162 W. Randolph St., Columbus, O.
- ★Corbin Screw Corporation, New Britain, Conn.
- ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y. (Brass & steel.)
- Detroit Screw Works, Detroit, Mich.
- Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich.
- Ellis Mfg. Co., The, Milldale, Conn.
- Gasket Supply Co., The, 1729 Ludlow St., Phila., Pa. (Copper, brass, steel & lead.)
- Graphite Lubricating Co., Bound Brook, N. J.

- Hill, Geo. Q. Co., 326 A St., Boston, Mass.
- Hoopes & Townsend Co., 1330 Buttonwood St., Phila., Pa.
- Ireland & Matthews Mfg. Co., Detroit, Mich. "I & M." (Iron & steel.)
- Mason Machine Co., Bridgeport, Pa. "Satin Finish." (Iron, steel & brass.)
- Michigan Bolt & Nut Works, foot of Meldrum Ave., Detroit, Mich.
- ★Milton Mfg. Co., Milton, Pa.
- Pawtucket Mfg. Co., 327 Pine St., Pawtucket, R. I.
- Peninsular Milled Screw Co., Champlain & Canton Aves., Detroit, Mich.
- Plymouth Mills, Plymouth, Mass. (Metal.)
- Quadruga Mfg. Co., 119 N. Canal St., Chicago, Ill. (Iron & steel.)
- ★Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
- Schweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich.
- ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich. (Finishing.)
- Sterling Machine & Stamping Co., Wellington, Ohio.
- Stevens & Co., 375 Broadway, N. Y. City.
- Taunton Rivet Works, Taunton, Mass.
- U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.
- W. & S. Mfg. Co., Worcester, Mass.
- Wrought Washer Mfg. Co., Reynolds & Wilcox Sts., Milwaukee, Wis. (Iron & steel.)

**WASHERS, Mica**

(See Insulation.)

**WASTE, WIPING RAGS, ETC.**

- Auto Waste Co., Box 262, Hartford, Conn.
- Bailey Oil Co., Toledo, O. "Bailey."
- Becker, Chas. W., Amsterdam, N. Y.
- Blakely, John & Son, 1089 Germantown Ave., Phila., Pa.
- Briggs, H. A. & Co., Pawtucket, R. I. (Cotton.)
- Broderick & Bascom Rope Co., 809 N. Main St., St. Louis, Mo. (Cotton.)
- Carpenter, Geo. B. & Co., 202-208 South Water St., Chicago, Ill. (Cotton waste.)
- Continental Waste Co., 22 Clayton St., Dorchester, Mass. "Pearl," "Ruby" & "Gar-net."
- Detroit Mfg. Supply Co., 38-40 Sherman St., Detroit, Mich. (Waste & wiping rags.)
- Detroit Sanitary Rag Co., 394 Harper Ave., E., Detroit, Mich. (Wiping rags.)
- Dorchester Waste Co., 1204-10 Dorchester Ave., Boston, Mass.
- Fowler Waste Mfg. Co., 414 S. Front St., Phila., Pa. (Cotton.)
- Geoghan, A. & Son, Inc., 207 Newell St., Brooklyn, N. Y. (Also polishing cloths.)
- Hagy, Clayton L. & Son, 16th & Carpenter Sts., Phila., Pa. (Cotton.)
- Hagy, J. Milton Waste Works, 433 Spruce St., Phila., Pa. "Fidelity."
- Hoffman-Corr Mfg. Co., 55-57 White St., N. Y. City. "Lion." (Cotton waste.)
- Keystone Oil & Supply Co., Inc., Pittsburg, Pa. "Keystone."
- Leschen, A. & Sons Rope Co., 920 N. First St., St. Louis, Mo. (Cotton.)
- Lillie, Dexter P. Co., Indian Orchard, Mass. (Cotton.)
- Lyman, John B. Co., 119 Liberty St., Springfield, Mass. "U." (Wiping rags.)
- Lynch, Alonzo K., Inc., 310-12 Flushing Ave., Brooklyn, N. Y. (Cotton.)

**WASTE, WIPING RAGS, etc.—Continued**

Mills Remnants Co., 102-04 Greenwich St., N. Y. City. (Wipers.)  
 North, Jos. W. & Son, 6th, Fulton & Franklin Sts., Elizabeth, N. J.  
 Olmsted & Tuttle Co., Chicopee, Mass. (Cotton.)  
 Riverside Mills, Augusta, Ga. (Cotton.)  
 Royal Mfg. Co., 2 Rector St., N. Y. City. (Cotton & wool.)  
 South Atlantic Waste Co., Charlotte, N. C. (Cotton.)  
 Springfield Waste Co., Springfield, Mass. (Cotton & wool.)  
 Standard Waste Mfg. Co., 2306-10 N. American St., Phila., Pa. (Cotton.)  
 Sullivan Oil Co., 413 Wells St., Chicago, Ill. (Cotton waste.)  
 Tingley, Chas. O. & Co., Rahway, N. J. "C. O. T."  
 Winn, W. R., 143 Maiden Lane, N. Y. City. "Winn's." (Cotton waste.)

Mattson Rubber Co., Lodi, N. J.  
 Monarch Rubber & Oil Cloth Co., 41 N. 7th St., Phila., Pa. (Rubber & enameled drills & ducks.)  
 ★Mutt, L. J. Co., 28 Summer St., Boston, Mass.  
 Standard Oil Cloth Co., 320 Broadway, N. Y. City. "Meritas." (Oil cloth, enameled duck, lamp covering material.)  
 Trenton Oil Cloth & Linoleum Co., Trenton, N. J. "Cooks'." (Enameled muslins, duck & drills, rubber cloth, etc.)

**WATCHES**

(See Clocks.)

**WATER COOLERS**

(See Radiators.)

**WATCH HOLDERS**

Adams, Henry T. Co., 6823 South Chicago Ave., Chicago, Ill. (Auto, motorcycle & bicycle.)  
 Lang, Henry L., Staunton, W. Va.  
 Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill. "Anchor." (Vacuum.)

**WATER GAUGES**

Industrial Instrument Co., Foxboro, Mass. "Standard."  
 Jenkins Bros., 71 John St., N. Y. City. "Grabber."  
 Lonergan, J. E. Co., 211-13 Race St., Phila., Pa.  
 ★Lunkenheimer Co., The, Cincinnati, O.  
 Penberthy Injector Co., 360 Holden Ave., Detroit, Mich.  
 Reliable Water Gauge Co., 1616 Pine St., St. Louis, Mo. "Reliable."  
 Steam Carriage Boiler Co., W. First & Albany Sts., Oswego, N. Y.

**WATER JACKETS**

Badger, E. B. & Sons Co., 63 Pitts St., Boston, Mass. (Copper.)  
 Goodnow & Blake Mfg. Co., 4th & Porter Sts., Detroit, Mich. (Copper.)  
 New Britain Mfg. Co., New Britain, Conn.

**WATER MOTORS**

Tessmer Machine & Tool Co., 285-287 Rivard St., Detroit, Mich. "Ideal."

**WATERPROOF MATERIALS**

Acme Rubber Mfg. Co., E. State St., Trenton, N. J. "Acme." (Rubber cloth.)  
 Auto Fabrics Co., Ltd., Thoroughfare Bldg., Broadway & 57th St., N. Y. City.  
 Clifton Mfg. Co., Boston, Mass. (Rubber coated cloths.)

**WATCHES**

(See Clocks.)

**WATER COOLERS**

(See Radiators.)

**WEARING APPAREL**

(See Caps, Clothing, Leggings.)

**WELDING**

(See also "Brazing.")

Akron-Selle Co., The, Akron, O. (Electric.)  
 American Tube & Stamping Co., The, Bridgeport, Conn. (Electric.)  
 Autogenous Welding Co., 41 Bay St., Springfield, Mass. (Oxy-acetylene.)  
 Chicago Welding Co., 515 Laflin St., Chicago, Ill. (Oxygen-acetylene.)  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y. (Autogenous.)  
 Davis-Bournonville Co., 90 West St., N. Y. City. (Oxy-acetylene welding & cutting.)  
 Deppeler, The J. H. Co., 819 Jersey Ave., Jersey City, N. J. (Oxy-acetylene.)  
 Eberhard, C. F., 25 Helen St., Buffalo, N. Y. (Oxy-acetylene.)  
 Electric Welding Products Co., The, Cleveland, O. (Electric.)  
 Fore River Ship Building Co., Quincy, Mass. (Autogenous.)  
 Garwood Electric Co., Garwood, N. J. (Arc.)  
 Goldschmidt Thermit Co., 90 West St., New York, N. Y.  
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.  
 Kalamazoo Steel Goods Co., Kalamazoo, Mich. (Electric.)  
 Lewis Electrical Welding & Mfg. Co., 234 Cherry St., Toledo, O. (Electric.)  
 Linde Air Products Co., The, Buffalo, N. Y. (Oxy-acetylene.)  
 National Welding & Mfg. Co., 1422-30 Niagara St., Buffalo, N. Y. (Autogenous.)  
 Pittsburgh Reinforced Brazing & Machine Co., 2525 Liberty Ave., Pittsburgh, Pa. (Aluminum & oxygen-acetylene.)  
 Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill. (Oxy-acetylene & thermit.)  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburgh, Pa. (Autogenous.)  
 Schaal, W. R. Tool & Machine Works, Grand Central Market Bldg., Harrison & Loomis Sts., Chicago, Ill. (Oxy-acetylene.)  
 Schaap Flame Utilities Corporation, 344 Cumberland St., Brooklyn, N. Y. "Schaap." (Flame.)  
 Standard Metalwork Co., 22-40 Prospect St., Thompsonville, Conn.



**WELDING—Continued**

- ★Standard Welding Co., The, 76th St., N. W., & L. S. & M. S. R. R., Cleveland, Ohio. (Electric.)
- Thomson Electric Welding Co., Lynn, Mass. Vulcan Brazing & Machine Co., 310-312 N. 16th St., Phila., Pa. (Aluminum.)
- ★Western Welding & Mfg. Co., 557 W. Jackson Blvd., Chicago, Ill. (Oxy-acetylene.)
- Williams, E. A. & Son, 76 Montgomery St., Jersey City N. J. (Broken gear & crank cases of aluminum.)
- Worcester Pressed Steel Co., Barber & North Aves., Worcester, Mass. (Autogenous.)

**WHEELS, Automobile**

- American Resilient Wheel Co., 1336 New York Ave., Washington, D. C. "American." (Resilient.)
- Archibald Wheel Co., Lawrence, Mass. "Archibald." (Motor truck.)
- Baltimore Hub-Wheel & Mfg. Co., 326-32 N. Holliday St., Baltimore, Md.
- ★Borbein Auto Co., 2109 N. 9th St., St. Louis, Mo.
- Bowden, Walter, 1619 Metropolitan Ave., Middle Village, L. I., N. Y. "Bowden."
- Central City Wheel Works, Syracuse, N. Y.
- Crane & MacMahon, 8-10 Bridge St., N. Y. City. "Hickory Nut."
- Delmar Auto Body & Wheel Co., Indianapolis, Ind.
- Eames, A. M. & Co., S. Framingham, Mass.
- Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
- Empire Wheel Works, 172 South St., Utica, N. Y.
- Gruss Spring Wheel Co., Genesee, Cal.
- Hagerstown Spoke & Bending Co., Hagerstown, Md. "Horseshoe."
- ★Hayes Wheel Co., Jackson, Mich.
- High Wheel Auto Parts Co., Muncie, Ind. (Sheave.)

- Hoopes Bros. & Darlington, Inc., West Chester, Pa.
- Imperial Wheel Co., Flint, Mich. "Imperial" & "Whalebone."
- Jamesville Mfg. Co., Jamesville, N. Y. "Red-skin."
- Jones, Phineas & Co., 301-311 Market St., Newark, N. J. "Jones."
- K. H. Wheel Co., 1208-50 Military Ave., Detroit, Mich. "K. H." (Spring.)
- Luverne Automobile Co., Luverne, Minn. "Luverne."
- Meeker Mfg. Co., The, Dayton, O.
- Mott Wheel Works, Pleasant St., Utica, N. Y. (Wire.)
- Muncie Wheel Co., Muncie, Ind.
- Murray Safety Wheel & Axle Co., The, 442 Atlantic Ave., McKeesport, Pa. "Murray." (Safety wheel & axle.)
- Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.
- New Haven Carriage Co., Water & Franklin Sts., New Haven, Conn.
- Prudden, W. K. & Co., Lansing, Mich.
- Quinby, J. M. & Co., 21-39 Division St., Newark, N. J.
- Rutherford Wheel Co., Stamford, Conn. "Rutherford." (Pneumatic.)
- Salisbury Wheel & Mfg. Co., Jamestown, N. Y.
- Sarven Wheel Co., Indianapolis, Ind.
- ★Schwarz Wheel Co., The, 20th & Glenwood Ave., Phila., Pa. "Schwarz."
- Shortsville Wheel Co., Shortsville, N. Y. "Heath."
- Standard Wheel Co., Terre Haute, Ind.
- Taylor, H. H. Spring Wheel Co., 523-24 Kohl Bldg., San Francisco, Cal. (Spring.)
- Tractor Engineering Co., Lamberton & Lalor Sts., Trenton, N. J. "Lea." (Truck.)
- Turnbull Wagon Co., The, Defiance, O. "Defiance."
- Union Wheel Works, Rear 157 Frelinghuysen Ave., Newark, N. J.
- ★Waverly Co., The, 139 S. East St., Indianapolis, Ind.

# THERE ISN'T A DOUBT

## AS TO THE PRACTICABILITY AND ECONOMY OF ELECTRIC WELDING

We are welding **automobile parts** for a **large number** of the **manufacturers**. **Parts**, too, that are **subjected** to the **greatest stress** and upon which **absolute dependence** must be placed. Axles, Gear Casings, Radius and Brake Rods, Pedal Levers, Steering Knuckles, Spring Hangers, Connecting Rods and Propeller Shafts are some of the articles being furnished. Our line of work eliminates the necessity of maintaining expensive forging dies.

### MOTORCYCLE AND BICYCLE PARTS

## THE STANDARD WELDING CO.

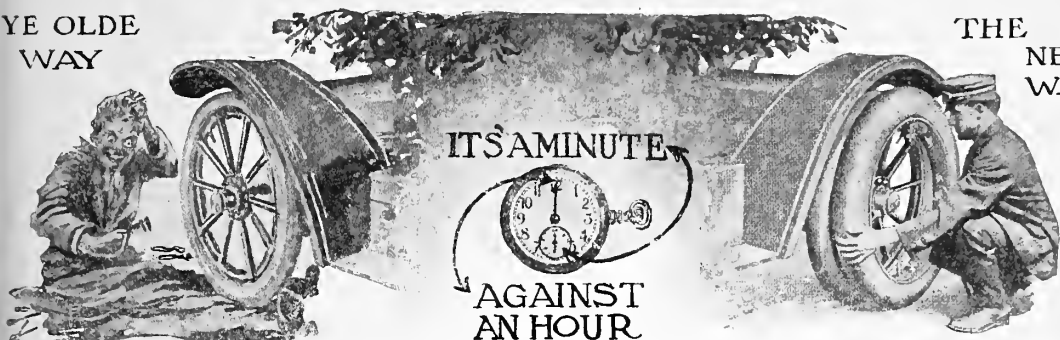
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AND CLEAN HANDS, CLOTHES AND GOOD HUMOR AGAINST  
A MUSSED UP MAN WITH A BAD GROUCH ☹-☹-☹-☹-☹

THE STEPNEY SPARE WHEEL is just another time, labor and temper-saving device and the most radical and appreciated improvement in this age of motoring development.

We want to install one as part of the equipment of every car in the country—and to get quick, positive action along this line, we will

## Send a Stepney Spare Wheel on 30 Days' Free Trial

to any car owner who wants to be shown the value of this "quick aid" device. Send for one yourself and carry it on your car for thirty days—experiment with it and use it the first time your machine shows evidence of "tire distemper."

Read the description :

THE STEPNEY SPARE WHEEL, when in use, takes the place of a complete wheel, overcoming all delays on the road, and in many instances saves the destruction of valuable tires and inner tubes through attempting to drive too far to reach a garage or other assistance before changing tires.

In case of puncture or blowout, it is only necessary to place the wheel alongside the punctured tire by means of two stationary clamps and two adjustable clamps operated by two thumbscrews.

No tools are necessary, and no changes to your wheels whatsoever; and no additional expense except the purchase of THE STEPNEY SPARE WHEEL with all its necessary parts.

Twenty-three thousand cars are already equipped with it—twenty-three thousand car owners are freed from long, tiresome halts and the "mussing up" of clothes and hands incident to the back-breaking process of puncture repairing or tire replacing.

Send no money—just your request,—and we will send you for Thirty Days' Free Trial any size wheel you may select—then,—if you like it,—send us your check; if you don't want it,—send it back "charges collect."

Take action to-day. Here are the prices, payable in 30 days, if satisfied.

28-inch wheels	- - \$20.00	32-inch wheels	- - \$24.00
30 " "	- - 22.00	34 " "	- - 26.00
	36-inch wheels	- - \$28.00	

THE STEPNEY COMBINATION SPARE WHEEL (which is adjusted to front or rear wheels of different diameters) is \$5.00 extra.

THE STEPNEY SPARE WHEEL, with quick detachable attachments, is \$5.00 extra.

STEPNEY  
STEPNEY

# AMERICAN STEPNEY SPARE WHEEL CO.

1776 Broadway (Goodrich Building), New York City

STEPNEY  
STEPNEY

Twenty Three Thousand Now in use

### WHEELS, Automobile—Continued

Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn.  
 Whitesides Wheel Co., West Tenth & Canal Sts., Indianapolis, Ind. (Wire.)  
 Wilmington Wheel Mfg. Co., The, Wilmington, Del. "Wilmington."  
 Zwick & Greenwald Wheel Co., Linden & Hoffman Sts., Dayton, O. (Wood.)

### WHEELS, Motorcycle

Taylor, H. H. Spring Wheel Co., 523-24 Kohl Bldg., San Francisco, Cal. (Spring.)

### WHEEL PARTS, Automobile

(See also Rims.)  
 Crane & MacMahon, 8-10 Bridge St., N. Y. City. "Hickory Nut." (Billets & rim strips.)  
 Ireland & Matthews Mfg. Co., Detroit, Mich. "I & M." (Wheel flanges & housings.)  
 Jones, Phineas & Co., 300-311 Market St., Newark, N. J.  
 ★Standard Co., The, Torrington, Conn. (Nipples.)  
 Von Behren Mfg. Co., Oakley & Morgan Sts., Evansville, Ind. (Felloes.)  
 Wheel & Wood Bending Co., 141 John St., Bridgeport, Conn. (Felloes.)  
 Wrought Washer Mfg. Co., Reynolds & Wilcox Sts., Milwaukee, Wis. (Felloe plates.)

### WHISTLES, Automobile

(See also Horns, Exhaust.)  
 Ashton Valve Co., 271 Franklin St., Boston, Mass. "Ashton."  
 Elkhart Dry Battery & Signal Co., 117 Commercial St., Elkhart, Ind. (Electric.)  
 Fenstermacher, O., 311 S. Fifth St., Minneapolis, Minn. "Howler."  
 Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. "G-P." (Air.)  
 ★Gray-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. (Complete outfits.)  
 Lennox Chemical Co., The, Cleveland, Ohio. "Lennox." (Complete outfits.)  
 Lonergan, J. E. Co., 211-13 Race St., Phila., Pa. (Steam.)  
 ★Lunkenheimer Co., The, Cincinnati, O. "Mocking-Bird."  
 ★Nightingale Whistle Mfg. Co., 1777 Broadway, N. Y. City. "Nightingale."  
 O'Brien Electrophone Co., Inc., Hallowell, Me. (Electric.)  
 Stanhope Forge & Machine Works, 27 Stanhope St., Boston, Mass. (Exhaust.)  
 Watres Mfg. Co., 1133 Broadway, N. Y. City. (Power.)  
 Westinghouse Air Brake Co., Pittsburg, Pa. (Air.)

### WHISTLES & WHISTLE OUTFITS, Motor Boat

American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City. "Full Tone." (Whistles.)  
 Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco." (Four-tone chimes.)  
 Bleecker, Augustus & Sons, 44 South St., N. Y. City. (Also bells.)

# Nightingale Whistle

"The Whistle with the harmonious six-note bird-like trill"



## THE SIMPLEST SIGNAL EVER

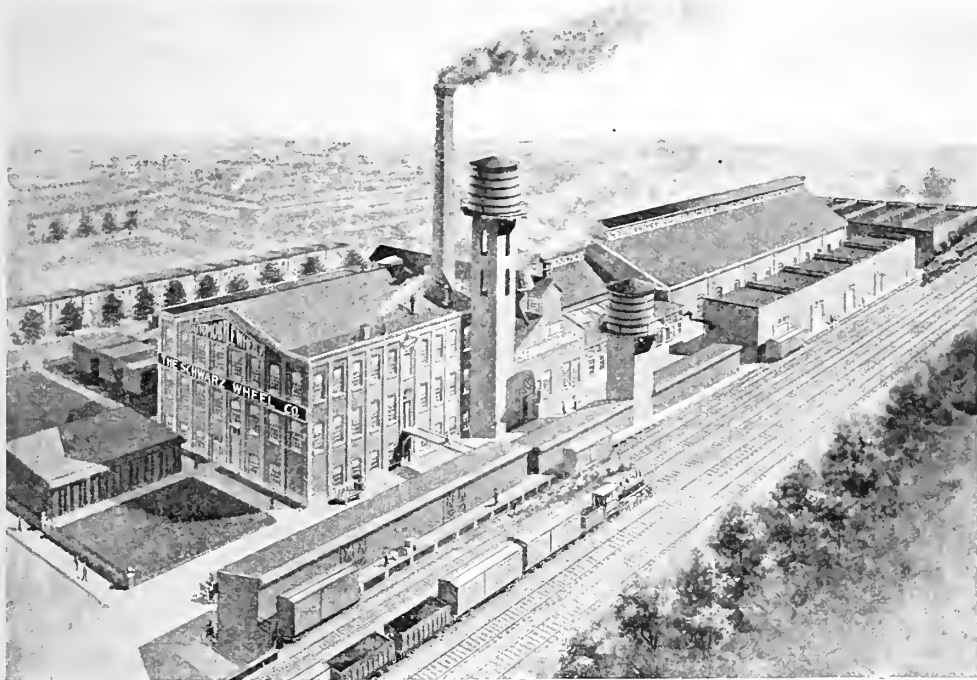
Has them all beaten a mile in penetration and a million miles in attractiveness. Operated from the exhaust. **Never clogs, never out of order, always ready, no two-way valve.** Made for 1, 2, 4 and 6-cylinder cars—all the same price.

OUTFIT **\$7.00** F. O. B. NEW YORK

Special Clamp for any exhaust pipe, 75c. With this Special Clamp  
**"Nightingale" can be attached by anybody in less than an hour**

**Nightingale Whistle Manufacturing Co.**

**1781 BROADWAY, NEW YORK**



## Where the Schwarz Wheel is Made

Put in operation March 1, 1910, with a modern, complete and elastic equipment sufficient to meet the requirements of the entire trade.

## The Schwarz Wheel

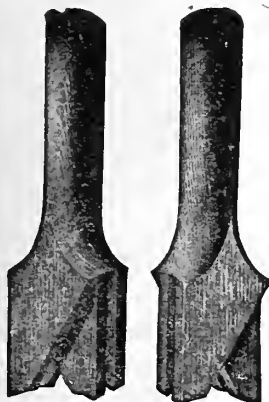
### The Best and Strongest Automobile Wheel Made

The spokes are grooved and mortised for interlocking and fit together tightly and immovably forming an absolute compact assemblage which cannot loosen under the most severe strain. The wheel will always run true, never wobble and saves tires. Can be made complete and shipped without hub.

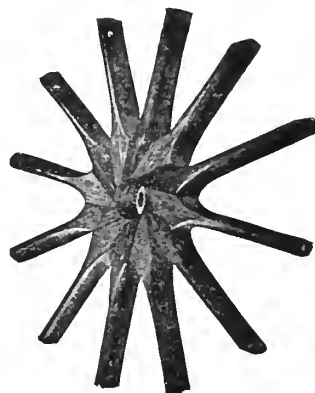
### The Safest and Most Economical

*Send for Illustrated Booklet*

**These are some of the cars equipped with Schwarz Wheels because they are the best to be had:**



**Schwarz Patent Spoke**



**Spokes Compressed**

Peerless, Winton, Packard, Alco, Stearns, Maxwell, Simplex, Matheson, Apperson, Atlas, Marmon, Garford-Studebaker, American Traveler, Corbin, Bergdoll, Mercer, Palmer & Singer, Lexington, Crawford, Baker Electric, Autocar, Rauch & Lang Electric, Sultan, Lozier, Croxton-Keeton, Carter, Grout, Gaeth, Fritchle Electric, Sellers, Luverne, Thomas, Oscar Lear Truck, Mack Truck, Lansden Truck, Hewitt Truck, Acme, Napier, Tinch, Shawmut, Reliance, Berkshire.

# The Schwarz Wheel Co.

## Philadelphia, Pa.

**WHISTLES & WHISTLE OUTFITS, Motor Boat—Continued**

- Brunner Mfg. Co., Utica, N. Y. "Parker."  
(Complete outfits.)  
Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O. "Champion."  
Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. "Caco." (Air.)  
★Gray-Hawley Mfg. Co., 605-9 Fort St., W., Detroit, Mich. (Complete outfits.)  
★Herz & Co., 203-05 Lafayette St., N. Y. City. (Complete outfits.)  
Lamont & Steers Engine Co., Stegmeyer's Boat Harbor, Rear 1470 Jefferson Ave., E., Detroit, Mich.  
Lovell-McConnell Mfg. Co., 365 Market St., Newark, N. J. (Whistles.)  
★Lunkenheimer Co., The, Cincinnati, O.  
Michigan Steam Motor Co., Pike & Garland Sts., Pontiac, Mich. (Automatic air pump.)  
Morss, A. S. Co., 210-212 Commercial St., Boston, Mass. "Morss." (Gas.)  
Noank Motor Co., The, Noank, Conn. (Whistles.)  
Russell Electric Co., The, Danbury, Conn. "Tresco" & "Rapid Fire." (Electric.)  
Watres Mfg. Co., 1133 Broadway, N. Y. City. (Power.)

**WHISTLES, Motorcycle**

- Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill. "Barco."  
★Gabriel Horn Mfg. Co., 1407 E. 40th St., Cleveland, O. "Gabriel."

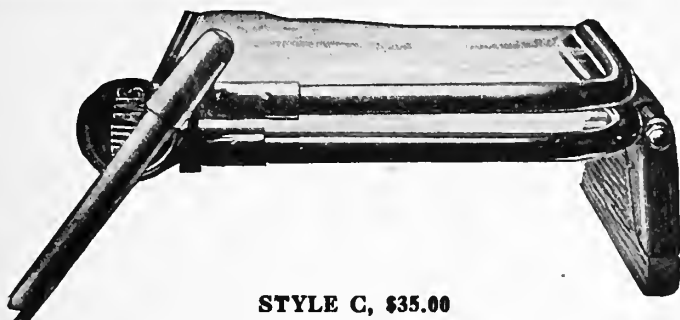
**WIND GUARDS & WIND DOORS**

- (For Dashboard.)  
Murray, P. A. & Co., Newton, Mass.

**WIND SHIELDS**

- Acme Auto Windshield & Top Co., Indianapolis, Ind.  
Adams & Westlake Co., 319 Ontario St., Chicago, Ill.  
Adapt Machinery Co., The, 1620-1630 Wabash Ave., Chicago, Ill.  
Alexander, The J. Co., 1931 Broadway, N. Y. City. (Small individual.)  
Amesbury Brass & Foundry Co., Amesbury, Mass.  
Anderson, F. W. & Co., Brown & Uber Sts., Phila., Pa. "Quality."  
★Auto-Automatic Windshield Co., Inc., Detroit, Mich. "Auto-Automatic."  
★Automobile Equipment Co., The, 260 Jefferson Ave., Detroit, Mich. "Auto Pneumatic."  
Automobile Metal Specialty Co., 4430 Market St., Phila., Pa. "Aval."  
Auto Top & Body Co., 249 N. Watts St., Phila., Pa.  
Auto Wind Shield Co., Cambridge, Mass. "Auto Wind Shield."  
B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, O. "Imported Automatic."  
Ball-Fintze Co., The, Newark, O. "Avalon."  
★Banker Bros. Co., Baum & Beatty Sts., Pittsburgh, Pa. "Banker."  
★Barndt-Johnston Auto Supply Co., The, 408-426 Donaldson St., Columbus, O. (Folding.)  
Baum's Brass & Model Works, 244 Third Ave., S., Minneapolis, Minn.  
Blasier, The M. E. Mfg. Co., 65-67 Columbia St., Utica, N. Y.  
Boesch Lamp Co., 1135 Mission St., San Francisco, Cal.  
Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn. "Miller."  
Broadway Auto Top & Body Co., 136 West 54th St., N. Y. City.  
Buob & Scheu, 1408-10 Gilbert Ave., Cincinnati, O.  
Cartier-Chapman & Co., Ludington, Mich. "Breeze."  
Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.  
Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill. "Dixie," "Perretz," "Chicago-Matic," "Adjusto," "Oriole," & "Zig-Zag."  
Coleman, J. C., 58-60 First St., Detroit, Mich.  
Collins, G. A. & Son, Akron, O. "Collins."  
Columbus Auto Parts & Machine Co., 4th & E. Goodall Sts., Columbus, O. "Duplex." (Glass.)  
Consumers' Auto Supply Co., The, 412 Diamond St., Pittsburg, Pa. "Simplicity."  
★Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y. "Cox Clear Vision."  
Cranmer, Harry C., 217 S. 24th St., Phila., Pa. "Philadelphia."  
Cream City Trimming Co., 67-69 Juneau Ave., Milwaukee, Wis.  
Denniston, E. E., 184 W. Mohawk St., Buffalo, N. Y.  
Detroit Steering Wheel & Wind Shield Co., 274-288 Wight St., Detroit, Mich. "Galvin."  
★Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich.  
Duane, W. J. & Co., 230 W. 58th St., N. Y. City.  
Eagle Co., The, 98 Warren St., Newark, N. J.  
English & Mersick Co., The, 122-26 Winchester Ave., New Haven, Conn. "E & M Tabor."  
Fellwock Automobile & Mfg. Co., The, Evansville, Ind. "Fellwock."  
Fickling & Co., 304-306 W. 49th St., N. Y. City.  
Findelsen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
Flanders, M. P., 61 Main St., Merrimac, Mass. "Perfection" & "Bulldog."  
Ford Auto Equipment Co., Inc., 1735 Michigan Ave., Chicago, Ill.  
Frankel Display Fixture Co., 177 Hudson St., N. Y. City. (Brass.)  
Gerhab & Ludlain, 305 Cherry St., Phila., Pa.  
Graves & Congdon Co., Carriage Ave., Amesbury, Mass.  
Grossman, Emil Co., 232 W. 58th St., N. Y. City. "Hydraulic" & "Spring Action." (Folding.)  
Guarantee Tire & Rubber Co., The, 208 & 210 S. Illinois St., Indianapolis, Ind. "Long Distance."  
Hill Mfg. Co., The, 25-27 Fuller St., Buffalo, N. Y. "Hill."  
Holcker-Elberg Mfg. Co., N. E. Cor. 16th & McGee Sts., Kansas City, Mo. "Holcker-Elberg."  
Holcomb Co., 105 Goffe St., New Haven, Conn. "New Haven."  
Ideal Wind Shield Co., 1926 Broadway, N. Y. City. "Ideal."  
Ireland & Matthews Mfg. Co., Detroit, Mich. "I & M." (Glass.)  
Irvin, R. J. Mfg. Co., 216-22 W. McCarty St., Indianapolis, Ind.  
Jacobson Bros., Bergen St. & 14th Ave., Newark, N. J. "Jacobson."  
Jenkins Specialty Mfg. Co., 37 Main St., Sumter, S. C.  
★Jonah & George, Merrimac, Mass.  
Kimball, C. P. & Co., 315-317 Michigan Ave., Chicago, Ill.  
King Top Mfg. Co., Main & First Sts., Dayton, O. "King."  
Knight, F. H., 1219-1221 Michigan Ave., Chicago, Ill. "Knight."  
Knight, H. C. & Co., 1725 Michigan Ave., Chicago, Ill.  
Kohl Mfg. Co., 10th & Canal Sts., Indianapolis, Ind. "Kohl Special."  
Krahn Mfg. Co., Milwaukee, Wis. "Krahn."

★ indicates Advertisers—see Index in back of book.



STYLE C, \$35.00

## A Williams Wind Shield for Everything

*from a Banana Cart  
to An Aeroplane*

Write for Catalogue and Prices

**20th Century Motor Car Supply Co.**  
SOUTH BEND, INDIANA

# VASCO

## WINDSHIELD

**Economical Enough for the Cheapest Car  
Efficient Enough for the Most Critical Car  
Elegant Enough for the Costliest Car**

Economical, because the VASCO is a genuine \$50 shield selling for \$35.

Efficient, because the VASCO works on friction discs, without springs, screws or nuts; can be slanted at any angle, with one hand, without stopping your car; clears any steering wheel easily; provides a "gap," protecting you in bad weather and at the same time giving you a clear view ahead.

Elegant, because the VASCO has solid brass tubing, finest French plate glass, and *de luxe* finish throughout.

**The Shield You've Been Wishing and Waiting For.**

### "Vasco" Bumper

This bumper actually *bumps*. It affords full protection to the radiator, lamps, and front of any car. Handsome solid brass finish, extra long and strong springs. A \$25 bumper for \$15.

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Does away with the old, expensive, injurious method of grinding valves with oil and emery. Put up in cartons containing two tubes, one coarse, one fine; and will grind valves faster, smoother and better than anything else. Small size, 25 cents. Large size, 75 cents, containing five times the amount.

Write for "VASCO" Catalog today and get acquainted with the "VASCO" quality products.

**VictorAuto Supply Mfg. Co., Inc.**  
43 W. 43d St. New York



**WIND SHIELDS—Continued**

- ★La Porte Carriage Co., La Porte, Ind. "La Porte."  
 Limousine-Carriage Mfg. Co., The, 3515 Michigan Ave., Chicago, Ill. "Voltz," "Schildback" & "Beecher."  
 London Auto Supply Co., 2540-48 Wabash Ave., Chicago, Ill. "Lasco" & "London."  
 Longdin-Brugger Co., Fond du Lac, Wis.  
 Lund Smith Co., The, 51 Godwin St., Paterson, N. J.  
 McCullough, J. H. & Son, 219 N. Broad St., Phila., Pa. "Peerless."  
 Medina Machine & Stamping Co., Medina, N. Y.  
 Metallic Specialties Co., 4228 Ludlow St., Phila., Pa.  
 ★Metal Stamping Co., 30-50 Hubert St., N. Y. City.  
 Meyer, Morris F., Port Huron, Mich.  
 Mezger, C. A., Inc., 239 W. 56th St., N. Y. City. "Mezger Automatic."  
 Milbradt Mfg. Co., 1436-42 N. 8th St., St. Louis, Mo. "Milbradt."  
 Model Iron & Wire Works, 32nd & Vliet Sts., Milwaukee, Wis. "Model."  
 Modern Auto & Equipment Co., 607 St. Clair Ave., N. E., Cleveland, O. "Modern."  
 Motor Specialty Co., 870 Woodward Ave., Detroit, Mich. "Carey."  
 National Auto Top Co., 1904 Broadway, N. Y. City. "National."  
 Newark Rivet Works, 262 Lafayette St., Newark, N. J. "Friction."  
 New England Auto Top Co., 128 W. 52nd St., N. Y. City. (Folding.)  
 Nichols, D. P. Co., 11 Edgewood St., Roxbury, Mass.  
 Nonpareil Brass Co., 143 Summer St., Providence, R. I.  
 Novelty Mfg. Co., Maple St., Waterbury, Conn. "Ajax" & "Kingsley."  
 Parish & Cather, 1006 S. Los Angeles St., Los Angeles, Cal. "Tabor." (Folding.)  
 Parsons-Curtis Top Co., 1312 W. Harrison St., Chicago, Ill. (Folding glass fronts.)  
 Paterson Vehicle Co., 257 Market St., Paterson, N. J.  
 Perkins, A. D., 315-17 E. 33rd St., Los Angeles, Cal. "Perkins."  
 Pierce, Geo. W. & Co., 2203 S. Main St., Anderson, Ind. "Pierce."  
 Pioneer Auto Top & Supply Co., 1721 Baltimore Ave., Kansas City, Mo. "Kansas." (Glass.)  
 Pittsburgh Auto Equipment Co., Baum St., Pittsburgh, Pa. "Union."  
 Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson."  
 Puritan Mfg. Co., Milwaukee, Wis.  
 Quinby, J. M. & Co., 21-39 Division St., Newark, N. J.  
 Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis. "The Racine."  
 Racine Mfg. Co., Racine, Wis.  
 Rands Mfg. Co., 67-89 Fort St., E., Detroit, Mich.  
 Rex Shield & Mfg. Co., Connersville, Ind. "Rex."  
 Riley Bros., Bridgeton, N. J. "Riley."  
 Ross & Browne, 6127 Cottage Grove Ave., Chicago, Ill.  
 Russell, H. J., 32 Exchange St., Worcester, Mass. "Angle."  
 S. M. Supplies Co., The, 22-24 Lincoln St., Boston, Mass. "Boston," "Lincoln" & "Hartford."  
 Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill.  
 Smith, J. Stewart, 1779 Broadway, N. Y. City. "Century."  
 ★Smith, Jos. N. & Co., Fourth & Porter Sts., Detroit, Mich. "Ackerman."  
 ★Sprague Umbrella Co., Norwalk, Ohio. "Sprague," "Common Sense," "Leader," "Surprise" & "Sprague's Special."  
 Springfield Metal Body Co., 364 Birnie Ave., Springfield, Mass. (Glass.)

- Standard Automatic Wind Shield Co., 66 Fort St., E., Detroit, Mich.  
 ★Standard Co., The, Torrington, Conn.  
 Sterling Auto Top Co., Congress & First Sts., Detroit, Mich. (Front & centre inside.)  
 Stevens-Britton-Maurel Co., 1783 Broadway, N. Y. City.  
 Teel Mfg. Co., Medford, Mass. "Teel."  
 ★Troy Carriage Sunshade Co., The, Troy Ohio. "Troy." (Folding & solid.)  
 ★Twentieth Century Motor Car Co., 121-125 S. Lafayette St., South Bend, Ind. "Williams."  
 Universal Wind Shield Co., 130-34 S. Clinton St., Chicago, Ill. "Universal."  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard" & "Breechlock."  
 ★Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, O. "Gordon."  
 Vetter Top Co., 49 & 51 W. 66th St., N. Y. City.  
 ★Victor Auto Supply Mfg. Co., 42 W. 43d St., N. Y. City. "Vasco."  
 Wall, R. C. Mfg. Co., 1334-36 Race St., Phila., Pa.  
 Werner, Geo. & Sons, 1133-37 Main St., Buffalo, N. Y.  
 Westchester Appliance Co., 13-15 Canal Place, Bronx Boro., New York. "Westchester."  
 Western Auto Top Co., 1122-24 E. 15th St., Kansas City, Mo.  
 Western Brass Mfg. Works, 21st St. & Campbell Ave., Chicago, Ill. "Telescope."  
 Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal. "Western Universal" & "Kingley." (Glass.)  
 Whiting, Dr. T. Henry, 217 Masonic Temple, Rockford, Ill. (Folding.)  
 Widman, J. C. & Co., 44th, 15th, Kirby Ave. & G. T. Ry., Detroit, Mich.  
 Wisconsin Auto Top Co., Racine, Wis. "Badger."

**WIND SHIELD CLEANERS**

(See Glass Front Cleaners.)

**WIND SHIELD FITTINGS**

- Curry & Abeles, 229 Mulberry St., Newark, N. J.  
 Fowler Brass Works, The, Inc., 2333-35 Wabash Ave., Chicago, Ill.  
 Holland Veneer Works, Holland, Mich. (Filler boards.)  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.  
 Jordan, Edward B. & Co., 129 De Graw St Brooklyn, N. Y. (Filler boards.)  
 Lockwood Co., The 34 Mechanic St., Newark, N. J.  
 Michigan Copper & Brass Co., Detroit, Mich. "Volverine." (Tubing.)  
 Standard Cabinet Mfg. Co., Peru, Ind. (Wood windshield frames & filling in boards.)  
 Western Brass Mfg. Co., 21st St. & Campbell Ave., Chicago, Ill. (Brass.)

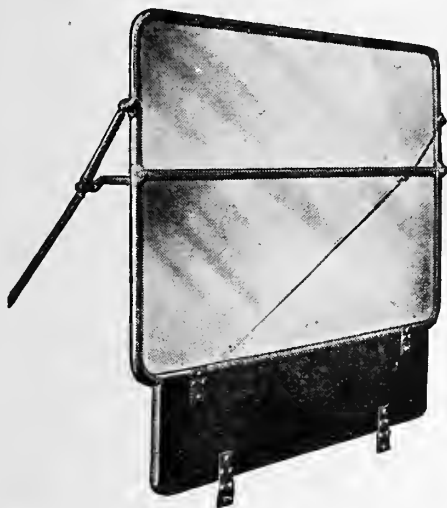
**WIND SHIELD GLASS PASTE**

(To prevent glass from becoming clouded in rain.)

- Bobrick Chemical Co., The, 111-117 S. Garey St., Los Angeles, Cal. "Fog-Off."  
 Schipper, H. F., Hamilton, Ohio. "Frost Queen."



# The Smoothest Wind Shield Proposition EVER BUILT



Up or down with one hand  
without changing position in your  
seat or slackening speed.

A positive lock, up or down.

No rattle or noise.

No thumb screws to get loose.

No coil springs to break glass.

No rubber bumpers to wear out.

The best constructed shield  
on the market. Solid brass frame  
and manganese bronze castings.  
Write us to-day for descriptive  
circular.

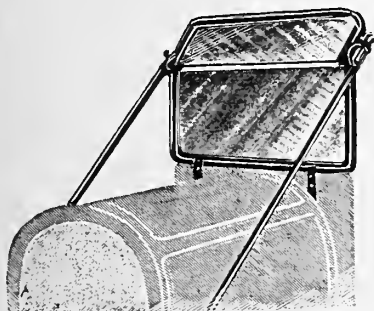
**Douglas & Lomason Co.**  
Dept. C, DETROIT, MICH.

The quality sells the  
Shield.  
Our Price makes you  
money.

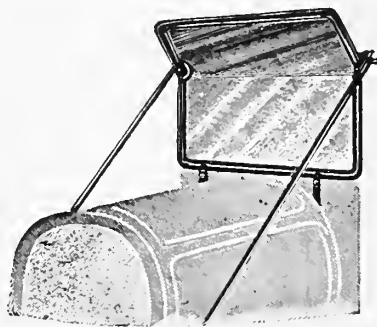
*Perkins*

# Challenge Windshield

**AFFORDS A PERFECT VISION**



For  
Top Car  
or  
Limousine



THE LOWER FRAME AS WELL AS THE UPPER

**WILL TILT TO ANY ANGLE,** Backward or Forward

Write for our NEW CATALOGUE containing over 100 automobile devices

**METAL STAMPING CO., NEW YORK**

**WIRE**

Newman, C. Wire Co., 143 Liberty St., N. Y. City. "Hercules." (Steel springs.)  
 Spencer Wire Co., Worcester, Mass. (Steel spring & nickel steel.)  
 Trenton Iron Co., Trenton, N. J. "T. I. C. O." (Steel Spring.)  
 Wright Wire Co., Worcester, Mass. (Spring & fan belt.)

**WIRE, Insulated**

(See Ignition Cable.)

**WIRE CLOTH**

Buffalo Wire Works Co., Inc., 316-20 Terrace, Buffalo, N. Y.  
 Howard & Morse, 45 Fulton St., N. Y. City. (Brass & copper.)  
 Hungerford, U. T. Brass & Copper Co., 497-503 Pearl St., N. Y. City. "Star."  
 New Jersey Wire Cloth Co., The, Trenton, N. J.  
 Smith, Edward F. & Co., 256 State St., New Haven, Conn.  
 Stevens & Co., 375 Broadway, N. Y. City.  
 Wright Wire Co., Worcester, Mass.

**WIRE GLASS**

Mississippi Wire Glass Co., 115 Broadway, N. Y. City.

**WOOD POLISH**

Adams & Elting Co., 159-163 Washington Blvd., Chicago, Ill. "Ad-el-ite."  
 Anderson Varnish Co., 3214 Sheffield Ave., Chicago, Ill. "Liquid Marble."  
 Aquila Chemical Co., 187 Third St., Milwaukee, Wis. "Lustre."  
 Automobile Repair Co., 1103-05 Pine St., St. Louis, Mo.  
 Bobrick Chemical Co., The, 111-17 S. Garey St., Los Angeles, Cal. "XXX."  
 Buffalo Oil, Paint & Varnish Co., Buffalo, N. Y.  
 ★Buffalo Specialty Co., 375-377 Elicott St., Buffalo, N. Y. "Liquid Veneer."  
 Caldwell, E. P. Co., 219 E. Fourth St., Waterloo, Iowa. "Caldwell's Polish Veneer."  
 Century Novelty Co., 241 Jefferson Ave., Detroit, Mich. "Hatt."  
 Channell Chemical Co., 1534 W. Lake St., Chicago, Ill. "O-Cedar."

Cleanola Co., 1101 Fulton Bldg., Pittsburg, Pa. "Cleanola."  
 ★Columbia Lubricants Co. of New York, 116 Broad St., N. Y. City. "Monogram."  
 ★Crown Mfg. Co., The, 407 S. Illinois St., Indianapolis, Ind. "Bailey's Crown."  
 Detroit Varnish Co., Detroit, Mich. "Rogers Auto-Brite."  
 Ditzler Color Co., 18-24 Baltimore Ave., W., Detroit, Mich.  
 Eclat Mfg. Co., 3425 State St., Chicago, Ill. "Eclat."  
 Enterprise Supply Co., The, 501 Commercial National Bank Bldg., Chicago, Ill. "Sherk's Enterprise Car Renovator."  
 Foskett & Co., 226-28 La Salle St., Chicago, Ill. "Peerless."  
 Glistener Mfg. Co., 622 Cypress St., Kansas City, Mo. "Lee's Glistener."  
 ★Hollingshead, The, R. M. Co., Camden, N. J. "Nugloss."  
 Jewel Mfg. Co., 21st St. & Marshall Blvd., Chicago, Ill. "Nelson."  
 Kenney, F. Mfg. Co., 360-368 Dorchester Ave., Boston, Mass.  
 Lucas, John & Co., Philadelphia, Pa. "Auto-Klean."  
 Miller, Chas. E., 97-101 Reade St., N. Y. City. "Pan-American."  
 Mooney, A. J., 359-63 Ninth Ave., N. Y. City. "Mooney's" & "Glosserene."  
 Morrill, M. O., 172 W. 24th St., N. Y. City. "Tar-co-la."  
 Morris, R. W. Co., 17 E. Missouri Ave., Kansas City, Mo. "Golden Star."  
 Nesmith, C. I. Co., Reading, Mass. "Auto-Shine."  
 NoXal Polish Mfg. Co., 1238-44 Belmont Ave., Phila., Pa. "NoXal."  
 Orient Specialty Co., 178 Fulton St., N. Y. City. "Magico."  
 Peerless Cleaner Co., Glenolden, Pa. "Peerless."  
 Royal Lubricating Oil Co., 116 Broad St., N. Y. City. "Royal."  
 St. Louis Surfacar & Paint Co., St. Louis, Mo. "Koonshine."  
 Schmoeger, F. A., Sterling, Ill. "Magiclean."  
 Shannon, T. R., Hartford, Conn. "Rapid."  
 Shi-Nal Co., 413 Emmet Road, Toledo, N. Y. "Varni-Cote."  
 Skat Mfg. Co., Hartford, Conn.  
 Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J. "Gray's Fur-no-Lac."  
 Stanley, John T., 650 W. 30th St., N. Y. City. "Levo."  
 Sweet, Charles F., Inc., 20 Ford St., Hartford, Conn. "Sweet's."  
 3-in-1 Oil Co., 42 Broadway, N. Y. City. "3-in-1."  
 Ulrich & Co., 227-233 E. North St., Buffalo, N. Y. "A. O. K." & "Raydo."  
 Uncle Sam Polish Co., 335 Monroe Ave., Detroit, Mich. "Uncle Sam."  
 United Supply Agency, 912 Westminster St., Providence, R. I. "Hallett's Columbian" & "U-Auto."  
 ★Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill. "Vanguard."  
 Vita Mfg. Co., 1151-57 Stanford Ave., Los Angeles, Cal. "Vita."  
 ★Weiss Polish Works, 714 S. Marshfield Ave., Chicago, Ill. "Mats."  
 ★White & Bagley Co., The, Worcester, Mass. "Oilzum."  
 Winn, W. R., 143 Maiden Lane, N. Y. City. "Winn's."

**YOKES, Steering**

(See Steering Yokes.)

## THE POLISH OF MERIT



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## WE'VE GOT IT!

Just what you want for your automobile.

## MAT'S BODY POLISH

**The Only** automobile body and leather dressing polish in the market.

To claim superiority is one thing, to prove it another. We do both.

**Mat's Body Polish** contains no acids, has no sediment and requires no shaking. It will not evaporate and will not streak the body. Softens leather and renders it water-proof. Its application a mere pleasure. We can convince you of its merits by sending sample on application, free of charge.

FOR SALE BY ALL LEADING SUPPLY HOUSES

**WEISS POLISH WORKS**  
CHICAGO, ILL.

## CUT DOWN YOUR REPAIR BILLS!

LEARN THE TRUTH ABOUT



## DECARBONIZER,—

the original German success,—and stop paying big bills for having your engine torn to pieces and scraped. FLASH DECARBONIZER is a compound dissolvent in dry form for the prevention and removal of carbon deposits in cylinders, tops of pistons, valves, exhaust pipes and muffler. FLASH DECARBONIZER is guaranteed not to destroy the glaze or glassy surface of the cylinder walls, nor cause pistons to pump oil,—the great objection to use of kerosene or chemical liquid carbon removers. FLASH DECARBONIZER contains no chemical and will not injure the finest motor. It is the HOME WAY,—the EASY WAY,—the CHEAP WAY. Use it and you will soon find it indispensable.

Retail price,—\$1.00 a package. If your dealer cannot supply you, write to us.

**Flash Manufacturing Co., 409-411 Canal St., Zanesville, Ohio**

## Section III

# Factory, Shop, Foundry and Garage Equipment MACHINERY AND TOOLS

Classified According to Products  
Headings in Alphabetical Order

### ABRASIVES

American File Sharpening Co., 287 Broadway, N. Y. City. "Carboflynt."  
American Steel Wool Mfg. Co., 457 Greenwich St., N. Y. City. (Steel wool.)  
Carborundum Co., The, Niagara Falls, N. Y. (Carborundum powders.)  
Rhodes, J. H. & Co., Chicago, Ill. (Steel wool.)  
Tanite Co., The, Stroudsburg, Pa. (Emery powder.)

### AIR COMPRESSORS

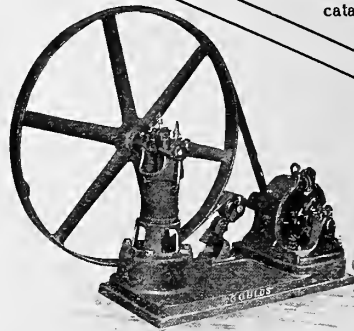
Allis-Chalmers Co., Milwaukee, Wis.  
★American Steam Pump Co., Battle Creek, Mich. "American."  
Artizan Brass Co., 204 Lincoln Park Blvd., Chicago, Ill. "Artizan." (Tank, motor & pump.)  
Atmogen Machine Works, Westminster Station, Vt. (Portable gasoline.)  
Auburn Auto-Pump Co., 1 Mason Lane, Auburn, N. Y. (Also power pumps.)  
Bacon, Frank W., 16th & Harney Sts., Omaha, Neb. "American."  
Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich. "Yale."  
Beach-Russ Co., 182 West St., Brooklyn, N. Y. "Beach."  
Bessemer Gas Engine Co., The, Grove City, Pa. "Bessemer."  
Bishop & Babcock Co., 525 Garfield Bldg., Cleveland, Ohio. (Hand and power.)  
Blaisdell Machinery Co., The, Bradford, Pa.  
Brown, E. R., Beer Pump Co., 11 Chardon St., Boston, Mass. "Success."  
Brunner Mfg. Co., Utica, N. Y. "Parker."  
Bury Compressor Co., Erie, Pa.  
Callahan, The W. P. Co., 909 E. Third St., Dayton, Ohio.  
Carruthers-Fithian Clutch Co., The, Grove City, Pa. "C. F."  
Cast Iron Brazing & Mfg. Co., Manchester, N. H.  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Christensen Engineering Co., The, 841-47 30th St., Milwaukee, Wis. "Christensen."  
★Clayton Air Compressor Works, The, 115 Broadway, N. Y. City. "Clayton."  
Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, Ohio. "Champion." (Electric.)  
Climax Specialty Co., Seneca Falls, N. Y.  
Comstock, Geo. S., Mechanicsburg, Pa.  
Cooley Mfg. Co., Waterbury, Vt.  
Crowell, J. G., 296-98 Taaffe Pl., Brooklyn, N. Y. "Crowell." (Also power pumps.)  
Curtis & Co. Mfg. Co., Williston, Mo.  
Dickerson, Malcolm, 118 Market St., Newark, N. J.  
Ft. Wayne Engineering & Mfg. Co., Ft. Wayne, Ind. "Astrom."  
★General Electric Co., Schenectady, N. Y. "G. E."  
General Fire Extinguisher Co., Providence, R. I.  
Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. "G.-P."  
★Goulds Mfg. Co., The, Seneca Falls, N. Y. "Goulds." (Also power pumps.)

★Gray-Hawley Mfg. Co., 605-609 Fort St., West, Detroit, Mich.  
Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill.  
Ingersoll-Rand Co., 11 Broadway, N. Y. City. (Steam and power driven.)  
Jacobson Machine Mfg. Co., Warren, Pa.  
Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."  
Law, F. A. Machine Co., 41 Wells St., Hartford, Conn.  
Martin & Anson Co., 2226-28 Indiana Ave., Chicago, Ill.  
Mietz, Aug., 128-138 Mott St., N. Y. City. "Mietz."  
★Nightingale Whistle Mfg. Co., 1777 Broadway, N. Y. City. "Delpeuch."  
Orange Machine & Mfg. Co., The, 10-14 Stetson St., Orange, N. J. "Little Giant."  
Oswald, O. J. & Co., 148-150 N. Smia St., Grand Rapids, Mich. (Also power pumps.)  
Pangborn, Thos. W. Co., 90 West St., N. Y. City. "High Pressure."  
★Rohrbacher Automatic Air Pump Co., 173 E. Water St., Portland, Ore. "Rohrbacher."  
★Spacke, The F. W. Machine Co., Madison Ave., Merrill & Penn Sts., Indianapolis, Ind.

## GOULDS

### HAND AND POWER AIR PRESSURE, VACUUM AND ROTARY PUMPS

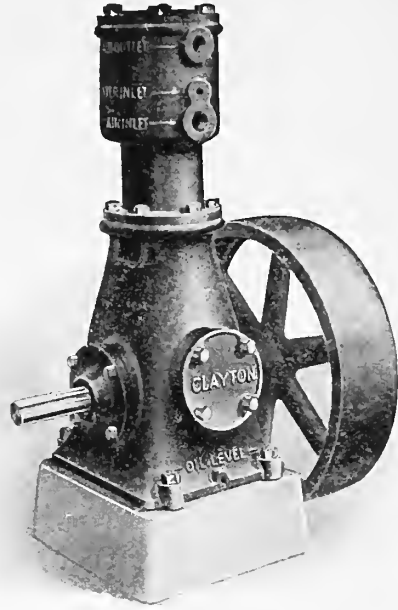
represent all that is best in Pump construction, for Garage, Factory and Private use. Our line is a most complete one.  
Write us for catalog.



The Goulds Mfg. Co., 76 W. Fall St., Seneca Falls, N. Y.  
Branches in All Large Cities

# THE CLAYTON HIGH SPEED GARAGE AIR COMPRESSOR

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Designed particularly for Automobile Garage work, for inflating pneumatic tires, cleaning cushions, etc., etc.

Note the following features :

*Enclosed Frame — Dust Proof — Self-Oiling — Noiseless — Oil Reservoir in bottom of frame base, into which connecting rod dips, throwing oil onto all bearings and thoroughly lubricating every part — No oil cups or lubricating attention necessary — No stuffing-boxes to pack — No parts to be adjusted — All bearings renewable — No clearance in air-cylinder — Small floor-space required — Easy to install — No skilled attention necessary.*

Built in Single, Duplex or Triplex Style, as desired.

Send for Bulletin C-205, which fully describes these machines.

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## The Clayton Air Compressor Works

115 BROADWAY, NEW YORK

Works: East Cambridge, Mass.

Branch Offices in all Principal Cities

**AIR COMPRESSORS—Continued**

- Standard Pattern & Mfg. Co., The, Richmond, Ind. "Richmond Standard."  
 Thomas, W. K., 1876 Broadway, N. Y. City. "Thomas."  
 ★Toomey, Frank, 131 N. 3rd St., Phila., Pa.  
 Victor Electric Co., 55-61 Market St., Chicago, Ill. "Victor." (Also power pumps.)  
 Weber Gas Engine Co., Kansas City, Mo. "Weber."  
 Westinghouse Air Brake Co., Pittsburg, Pa. "Westinghouse."

**AMMETERS, Switchboard Type**

- Bristol Co., Waterbury, Conn. "Bristol." (Recording.)  
 Clark Electric Meter Co., 141-3 Clinton St., Chicago, Ill.  
 Dow Mfg. Co., The, 131 Adams St., Braintree, Mass. "Dow."  
 Eldredge Electric Mfg. Co., 3 Post Office Square, Springfield, Mass. "Advance."  
 ★Hoyt Electrical Instrument Works, Penacook, N. H. "Hoyt."  
 International Electric Meter Co., 330 W. Randolph St., Chicago, Ill.  
 Keystone Electrical Instrument Co., 9th St. & Montgomery Ave., Phila., Pa.  
 Manhattan Electrical Supply Co., 17 Park Pl., N. Y. City. "Elite."  
 Pignolet, Louis M., 78 Cortlandt St., N. Y. City.  
 Reliance Instrument Co., 527 W. Van Buren St., Chicago, Ill. "Reliance."  
 Robert Instrument Co., The, 56 Shelby St., Detroit, Mich. "Robert Pocket."  
 Weston Electric Instrument Co., Waverly Park, Newark, N. J. "Weston."

**ANNEALING & HARDENING BOXES**

- Brown & Sharpe Mfg. Co., Providence, R. I.  
 Cleveland Wire Spring Co., Cleveland, Ohio. (Pans.)  
 Leetonia Boiler Co., Leetonia, Ohio.  
 McNeil, Jas. & Bro. Co., Pittsburg, Pa.  
 National Mfg. Co., Pittsburg, Pa.  
 Ohio Mfg. Co., The, Painesville, Ohio. (Pans.)  
 Reeves Bros. Co., Alliance, Ohio.

**ANNEALING & HARDENING FURNACES**

- American Gas Furnace Co., 24 John St., N. Y. City.  
 Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 ★Crosby Co., The, 171-189 Pratt St., Buffalo, N. Y.  
 Hoskins Mfg. Co., Detroit, Mich. "Hoskins."  
 ★Krieger Tool & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill. (Hardening furnaces.)  
 Monarch Engineering & Mfg. Co., The, 1200-1206 American Bldg., Baltimore, Md.  
 Rockwell, W. S. Co., 50 Church St., N. Y. City.  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.  
 Tate, Jones & Co., Inc., 806 Empire Bldg., Pittsburg, Pa.  
 U. S. Gas Furnace Co., 143 Eddy St., Providence, R. I.

**ANVILS**

- American Wrought Anvil Co., 12-18 Richard-son St., Brooklyn, N. Y. "American."  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich. "Monarch."  
 Fisher & Norris, Trenton, N. J.  
 Hay-Budden Mfg. Co., 254 N. Henry St., Brooklyn, N. Y. "Hay-Budden."  
 Illinois Iron & Bolt Co., Carpentersville, Ill.  
 Leiman Bros., 62 John St., N. Y. City.  
 Newhall Chain Forge & Iron Co., 90 West St., N. Y. City. "Banner." (Combination vise, anvil & drill.)  
 Phoenix Hardware Mfg. Co., Homer, N. Y. "Phoenix."  
 Wiebusch & Hilger, 106-10 Lafayette St., N. Y. City. (Peter Wright & Sons, imported.)

**ARBORS OR MANDRELS**

- Celfor Tool Co., Chicago, Ill. (Expanding mandrels.)  
 Cleveland Twist Drill Co., Cleveland, Ohio. (Arbors.)  
 Diamond Tool Works, Eden Center, N. Y. (Saw mandrels.)  
 Lecount, Wm. G., South Norwalk, Conn. (Expanding mandrels.)  
 McCrosky Reamer Co., The, Meadville, Pa. "McCrosky." (Expanding mandrels.)  
 Morse Twist Drill & Machine Co., New Bedford, Mass.  
 Nicholson, W. H. & Co., Wilkes-Barre, Pa. "Nicholson's." (Expanding mandrels.)  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass. (Saw arbors.)  
 Western Tool & Mfg. Co., The, Springfield, Ohio. "Champion." (Expanding mandrels.)  
 White, John A. Co., Dover, N. H. (Saw arbors.)

**ARBOR PRESSES**

- Barnes, W. F. & John Co., 204 Ruby St., Rockford, Ill. "Barnes."  
 Bartlett, Edwin E., 326 A St., Boston, Mass. "Greenerd."  
 King Machine Tool Co., The, Cincinnati, Ohio.  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Wilmarth & Morman Co., 583 Canal St., Grand Rapids, Mich.

**AUTOCLAVES**

- Buffalo Foundry & Machine Co., Buffalo, N. Y.

**AXE HANDLE FASTENERS**

- ★Massachusetts Machine Shop, Inc., 98 Beacon St., Worcester, Mass. "Hall."

**BABBITT MELTING FURNACES**

(See Metal Melting Furnaces.)

**BALANCING WAYS**

- Bowsher, N. P. Co., South Bend, Ind.

# ROCKWELL FURNACE FACTS



MODERN HARDENING AND TEMPERING PLANT—NO FLUES, NO STACKS

**P**ROPER HEAT TREATMENT is essential where uniform product is desired, and the temperature of the furnace must be accurate and controllable, not dependent upon atmospheric conditions which interfere with stack draft, or dependent upon quality of coal or coke or the frequency of stoking.

Our furnaces produce a uniform temperature throughout the heating chamber, preventing unequal heating and the consequent change of shape caused by one part being heated higher than another, and the resulting distortion which remains permanent, causing imperfections which often prevent use after that treatment is finished. The temperature in our furnaces may be regulated within 10 degrees or less **to suit the specific kind of work to be done**, eliminating guesswork and absolutely insuring the proper degree of heat required.

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## ROCKWELL FURNACE COMPANY

26 Cortlandt St.  
NEW YORK



**BAND SAWS**

- American Sawmill Machinery Co., Hacketts-town, N. J. "American."  
 American Wood Working Machinery Co., Rochester, N. Y. (Also resaws.)  
 Atkins, E. C. & Co., Indianapolis, Ind.  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich.  
 Bentel & Margedant Co., The, Hamilton, Ohio. "Hamilton." (Also resaws.)  
 Black Diamond Saw & Machine Works, Natick, Mass. "Black Diamond."  
 Colladay, Jas. O. Co., 624-26 Race St., Phila., Pa.  
 Connell & Dengler Machine Co., 254 Mill St., Rochester, N. Y. (Resaws.)  
 Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin." (Also resaws.)  
 Crescent Machine Co., The, Leetonia, Ohio. "Crescent."  
 Edge, Frank & Co., 31 & 33 S. Front St., Grand Rapids, Mich.  
 Emerson, Smith & Co., Ltd., Beaver Falls, Pa.  
 Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
 Hall & Brown Wood-working Machine Co., 1913-29 N. Broadway, St. Louis, Mo. (Also resaws.)  
 Marston, J. M. & Co., 226 Ruggles St., Boston, Mass.  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Reynolds Bros., Columbus, Ohio.  
 Root, B. M. Co., York, Pa. "Root."  
 Ross, Josiah Mfg. Co., 1443-59 Niagara St., Buffalo, N. Y. (Also resaws.)  
 Sidney Tool Co., The, Sidney, Ohio. "Sidney."  
 Silver Mfg. Co., Salem, Ohio. "Silver."  
 Smith, H. B. Machine Co., Smithville, N. J. (Also resaws.)  
 Thompson, Henry G. & Son Co., New Haven, Conn.  
 West Haven Mfg. Co., 22 Elm St., New Haven, Conn. "Utility."  
 West Side Iron Works, 31-33 S. Front St., Grand Rapids, Mich.  
 White, John A. Co., Dover, N. H.

**BARRELS, Tumbling**

(See Tumbling Barrels.)

**BARS, Boring**

(See Boring Bars.)

**BEARING SCRAPERS**

- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B. & B."  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 ★Buffum Tool Co., Louisiana, Mo.  
 Krauter & Co., Inc., 571-79 18th Ave., Newark, N. J.  
 Mound Tool & Scraper Co., 1606-1608 North Broadway, St. Louis, Mo. "Mound."  
 Roren Drop Forge Co., Providence, R. I.  
 Starrett, L. S. Co., Athol, Mass.  
 West Side Iron Works, 31-33 S. Front St., Grand Rapids, Mich.  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill.

**BELLOWS**

- Brand, S. H. Co., Chicago, Ill. "Brand's." (Pressure.)  
 Christen Bellows & Mfg. Co., St. Louis, Mo. (Hand.)  
 Dobson, Wm., Canastota, N. Y. "Dobson." (Hand.)  
 Leiman Bros., 62 John St., N. Y. City. (Foot.)  
 Paro, Edward, 3626 62nd St., Chicago, Ill. "Standard" & "Champion."

**BELTING**

(See also Belts, Fan, Pump &amp; Oiler.)

- ★American Belting & Tanning Co., 135 Oliver St., Boston, Mass. (Leather.)  
 Apex Belting Co., 242 Chestnut St., Phila., Pa. "Beaver."  
 Caldwell, W. H. & Son Co., Western Ave., 17th to 18th St., Chicago, Ill. (Link chain belting.)  
 Carpenter, Geo. B. & Co., 202-208 S. Water St., Chicago, Ill. (Rubber & leather.)  
 Coe & Brown, 202-204 George St., New Haven, Conn. (Leather.)  
 Crandall Packing Co., Palmyra, N. Y. "Crandall." (Leather.)  
 Gandy Belting Co., The, 728-40 W. Pratt St., Baltimore, Md. "Gandy," "Dixie." (Stitched cotton and duck.)  
 Graton & Knight Mfg. Co., 94-104 Bloomingdale Rd., Worcester, Mass. "Heart," "Gra Knight" & "Neptune." (Leather.)  
 Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass. "Hudson's Extra," "Climax," "Rival" and "Mermaid."  
 Jewell Belting Co., 53 Trumbull St., Hartford, Conn. "Gem," "Diver," "Extra" and "Hartford."  
 Kelton-Bruce Mfg. Co., 9-13 Franklin St., Salem, Mass. (Lace.)  
 ★McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich. "McCord." (Wire.)  
 National Leather Belting Co., 29 Ferry St., N. Y. City. "Old Oak." (Leather.)  
 New York Leather Belting Co., 51 Beekman St., N. Y. City.  
 Page Belting Co., Concord, N. H. (Leather.)  
 Peerless V Belt Co., The, 334-38 S. Clinton St., Chicago, Ill. "Peerless." (For sparkers, electric generators, motors, etc.)  
 Philadelphia Belting Co., 313-315 Vine St., Phila., Pa.  
 Preston Fabrio Tire Co., 1400-1410 Niagara St., Buffalo, N. Y. (Cotton.)  
 Rahmann, Geo. Co., 6 Ferry St., N. Y. City. "Amazon."  
 Republic Belting Co., The, Cleveland, Ohio. (Leather.)  
 Schieren, Chas. A. Co., Schieren Bldg., N. Y. City. (Leather.)  
 ★Thermoid Rubber Co., Trenton, N. J. "Evergood," "Samson," "Hercules," "Ajax," "Baffler," "Hornet," "Royal" & "Leader."  
 United & Globe Rubber Mfg. Co., Trenton, N. J. "Safety," "Alpha," "Globe," "Electric" and "Magic." (Rubber.)  
 Waban Webbing Co., 16 South St., Boston, Mass. "Bullet Proof." (Webbing.)  
 Weatherhead-Thompson Co., Pawtucket, R. I. (Leather.)  
 Williams, I. B. & Sons, Dover, N. H. "Cocheco" and "Gilt Edge."

**BELT TOOLS**

- Majestic Mfg. Co., Worcester, Mass. (Belt drill.)  
 ★N. S. U. Motor Co., 206 W. 76th St., N. Y. City. "N. S. U." (Belt punches.)

**BENCH LATHES**

(See Lathes.)

**BENCH VISES**

(See Vises.)

**BITS**

Brown, R. H. & Co., New Haven, Conn. "Clark's." (Expansive.)  
 Deuse, J. S., Chester, Conn. (Auger, gimlet & screw driver.)  
 Drew, C. & Co., Kingston, Mass.  
 Greenlee Bros. & Co., Rockford, Ill. (Auger & machine.)  
 Humphreysville Mfg. Co., Seymour, Conn. (Auger.)  
 Irwin Auger Bit Co., Wilmington, Ohio. (Auger & machine.)  
 Ives, W. A. Mfg. Co., Wallingford, Conn. "Mechphisto." (Auger.)  
 Jennings, C. E. & Co., 42 Murray St., N. Y. City. (Auger.)  
 Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn. "Lavigne." (Expansive.)  
 Ohio Tool Co., Columbus, Ohio. "Bailey." (Auger.)  
 Pittsburg Gage & Supply Co., 30th & Liberty Sts., Pittsburg, Pa.  
 Pugh, Job T., 31st & Ludlow Sts., Phila., Pa. "Pugh." (Auger.)  
 Russell-Jennings Mfg. Co., Chester, Conn. "Russell-Jennings." (Auger.)  
 Snell Mfg. Co., Fiskdale, Mass. "Snell." (Auger.)  
 Swan, Jas. Co., Seymour, Conn. (Auger.)  
 Syracuse Twist Drill Co., Syracuse, N. Y. (Screw Driver.)

**BIT BRACES**

Fray, John S. & Co., Bridgeport, Conn.  
 Goodell-Pratt Co., Greenfield, Mass.  
 Ives, W. A. Mfg. Co., Wallingford, Conn. "Mechphisto."  
 Lancaster Machine & Knife Works, Lancaster, N. Y. "Lancaster."  
 Mayhew, H. H. Co., Shellburne Falls, Mass.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Phoenix Hardware Mfg. Co., Homer, N. Y. "Phoenix."  
 Turner & Deegan, Bristol, Conn. "American" and "Barbers."

**BLADES**

Crescent Machine Co., The, Leetonia, Ohio. (Band saw.)  
 Racine Gas Engine Co., Racine Junction, Wis. "Racine." (Power hand saw.)  
 Thompson, Henry G. & Son Co., New Haven, Conn. "Milford." "Eureka-Yankee." "XL" and "TT." (Hack saw.)  
 York Band Saw Works, 242 S. Penn St., York, Pa. (Band saw.)

**BLOWERS, Pressure**

American Blower Co., Detroit, Mich.  
 American Gas Furnace Co., 24 John St., N. Y. City.  
 Beach-Russ Co., 182 West St., Brooklyn, N. Y.  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Canedy-Otto Mfg. Co., Chicago Heights, Ill. "Royal" and "Western Chief."  
 Champion Blower & Forge Co., Lancaster, Pa. "Champion."  
 Crowell, J. G., 296-298 Taaffe Pl., Brooklyn, N. Y. "Crowell." (Positive.)  
 Harvey, Arthur O. Co., 374 Congress St., Boston, Mass.  
 Hoysradt & Case, Kingston, N. Y.  
 Leiman Bros., 62 John St., N. Y. City.  
 Monarch Engineering & Mfg. Co., 1200-1206 American Bldg., Baltimore, Md.  
 National Blower Works, Milwaukee, Wis. (For heating, ventilating, drying and dust collating.)

New York Blower Co., Chicago, Ill.  
 Rockwell, W. S. Co., 50 Church St., N. Y. City. (Positive.)  
 Roots, P. H. & F. M. Co., Connersville, Ind.  
 ★Roth Bros. & Co., 1371 W. Adams St., Chicago, Ill. "Roth." (Electric.)  
 U. S. Gas Furnace Co., 143 Eddy St., Providence, R. I.

**BLOW PIPES**

American Gas Furnace Co., 24 John St., N. Y. City.

**BLUE PRINT MACHINES**

Buckeye Engine Co., Salem, Ohio. "Buckeye." (Electric.)

**BODY FACTORY EQUIPMENT**

Advance Machinery Co., The, Toledo, Ohio. (Glue heaters, cookers, spreaders, pots and pot warmers.)  
 ★Bennett-O'Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill. (Steam jacket glue pots.)  
 Bentel & Margedant Co., The, Hamilton, Ohio. "Hamilton." (Traversing gaining machines, seat back benders and jointers.)  
 Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin." (Jointers.)  
 Falls Machine Co., Sheboygan Falls, Wis. "Falls." (Feed glue jointers.)  
 Francis, Chas. E. Co., Rushville, Ind. (Glue pots, glue heaters and glue spreaders.)  
 ★Oliver Machinery Co., Grand Rapids, Mich. (Glue heaters, wood trimmers and jointers.)  
 Pancoast, Henry B. Co., 2110 Allegheny Ave., Phila., Pa. (Glue heaters.)  
 Power, L. & Co., Phila., Pa. (Jointers.)  
 Sidney Tool Co., The, Sidney, Ohio. "Sidney." (Jointers.)  
 Thurston, F. W., Chicago, Ill. (Rubbing bricks, imported.)  
 Waddell, R. J. & Co., 52 Beekman St., N. Y. City. (Powdered pumice stone.)

**BOILERS, WATER & FIRE TUBE**

Bigelow Co., New Haven, Conn. "Bigelow-Hornsby."

**BOILER TUBE EXPANDERS**

Peter Forg., 50 Park St., Somerville, Mass. "Forg."

**BOLT & NUT MACHINERY**

Acme Machinery Co., Cleveland, O. "Acme."  
 Brown, The H. B. Co., East Hampton, Conn. (Bolt & nut threading & heading machinery.)  
 Cook, Asa S. Co., 80 Huyshope Ave., Hartford, Conn.  
 Detrick & Harvey Machine Co., Baltimore, Md. (Bolt pointing, threading & nut facing machines.)  
 Garvin Machine Co., Spring & Varriek Sts., New York, N. Y.  
 Howard Iron Works, Buffalo, N. Y. "Burdiet." (Bolt heading and threading machines.)  
 Landis Machine Co., Waynesboro, Pa.  
 McCabe, J. J., 30 Church St., N. Y. City.  
 Mummert, Wolf & Dixon Co., Hanover, Pa. "Plurality Die."  
 National Machinery Co., Tiffin, Ohio.  
 New Doty Mfg. Co., Janesville, Wis.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa.  
 Niles-Rement-Pond Co., 111 Broadway, N. Y. City.

**BOLT & NUT MACHINERY—Continued**

Reece, E. F. Co., Greenfield, Mass. "Hercules." (Bolt threading machines.)  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
 Victor Tool Co., Waynesboro, Pa., "Victor." (Nut facing machines.)  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. "Waterbury."  
 Wells Bros. Co., Greenfield, Mass. "Little Giant." (Bolt cutters & nut tappers.)  
 Wiley & Russell Mfg. Co., Greenfield, Mass. "Lightning" and "Green River."

**BOLT & RIVET CLIPPERS**

Boynton & Plummer, Worcester, Mass.  
 Chambers Bros. Co., Phila., Pa. "Chambers."  
 Handy Tool Co., The, Bellevue, Ohio. (And punch combined.)  
 Helwig Mfg. Co., St. Paul, Minn. "Helwig."  
 Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
 Motch & Merryweather Machinery Co., The, 707-715 Lakeside Ave., N. W., Cleveland, Ohio.  
 Porter, H. K., 6 Ashland St., Everett, Mass. "Easy," "New Easy" & "Allen-Randall."  
 Putnam Machine Co., 10 to 100 Putnam St., Fitchburg, Mass.  
 Schollhorn, Wm. & Co., New Haven, Conn. "Elm City."

**BORING BARS**

Elmes, Chas. F. Engineering Works, Cor. Morgan & Fulton Sts., Chicago, Ill.  
 Hill Standard Mfg. Co., Anderson, Ind. "Hill."  
 ★Krieger Tool & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill. "Krieger." (Combination and multiple cutter auto bars; tool room sets for engine lathes.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Thompson, Henry G. & Son Co., New Haven, Conn. "Carr."  
 Underwood, H. B. & Co., 1025 Hamilton St., Phila., Pa.  
 Universal Boring Machine Co., Hudson, Mass.

**BORING MACHINES, Metal**

Baker Bros., Toledo, Ohio. (Cylinder.)  
 Barrett Machine Tool Co., Meadville, Pa. "Barrett."  
 Beaman & Smith Co., The, Gorton & Reynolds Ave., Providence, R. I. (Horizontal and cylinder.)  
 Betts Machine Co., Wilmington, Del. (Horizontal and vertical.)  
 Binsse Machine Co., The, Newark, N. J. (Horizontal.)  
 Bullard Machine Tool Co., The, 536 Broad St., Bridgeport, Conn. (Boring and turning mills.)  
 Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Radial.)  
 Colburn Machine Tool Co., Franklin, Pa. "Colburn."  
 Crescent Machine Co., The, Leetonia, Ohio. "Crescent."  
 Detrick & Harvey Machine Co., Baltimore, Md.  
 Espen-Lucas Machine Works, 342 N. 15th St., Phila., Pa. (Horizontal, floor.)  
 Fancher Machine Co., The, Baldwinsville, N. Y. (Flexible.)  
 Flather, E. J. Mfg. Co., Nashua, N. H. "Flather." (Vertical.)  
 Foote-Burt Co., 41st St. & St. Clair Ave., Cleveland, Ohio. (Cylinder.)  
 Fosdick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, Ohio. (Horizontal.)

Gisholt Machine Co., 1330 Washington Ave., Madison, Wis. "Gisholt." (Vertical.)  
 Hoefer Mfg. Co., Freeport, Ill. (Horizontal.)  
 Ingle Machine Co., 299-309 St. Paul St., Rochester, N. Y. (Horizontal.)  
 King Machine Tool Co., The., Cincinnati, O.  
 McCabe, J. J., 30 Church St., N. Y. City. (Horizontal and vertical.)  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill. (Horizontal and vertical.)  
 Manning, Maxwell & Moore Co., Inc., N. Y. City.  
 Mitts & Merrill, Saginaw, Mich.  
 National Equipment Co., Springfield, Mass. (Vertical.)  
 National Separator & Machine Co., Boston, Mass.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa. (Special cylinder.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Horizontal and vertical.)  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City. (Horizontal and vertical.)  
 Quint, A. D., 8 Clinton St., Hartford, Conn. (Turret.)  
 Rockford Drilling Machine Co., Rockford, Ill. (Horizontal and upright.)  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Horizontal and vertical.)  
 Springfield Machine Tool Co., Springfield, O. (Spindle and axle.)  
 Underwood, H. B. & Co., 1025 Hamilton St., Phila., Pa.  
 Universal Boring Machine Co., Hudson, Mass.

**BORING MACHINES, Wood**

American Sawmill Machinery Co., Hacketts-town, N. J. "American."  
 American Wood Working Machinery Co., Rochester, N. Y.  
 Bental & Margedant Co., The, Hamilton, O. "Hamilton."  
 Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Cleveland, Ohio. "Cleveland."  
 Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin."  
 Crane, W. W. Foundry & Machine Works, Auburn, N. Y. "Sheldon."  
 Hall & Brown Wood-Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo.  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor."  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Power, L. & Co., Phila., Pa.  
 Pringle & Brodie Machinery Co., 512-14 Canal St., Chicago, Ill. (Multiple.)  
 Smith, H. B. Machine Co., Smithville, N. Y.  
 Stow Mfg. Co., Binghamton, N. Y.  
 West Side Iron Works, 31-33 S. Front St., Grand Rapids, Mich.  
 White, John A. Co., Dover, N. H.

**BRAZING COMPOUND**

A. & J. Mfg. Co., 427 W. Randolph St., Chicago, Ill. "Braziron." (For cast iron.)  
 Cast Iron Brazing & Mfg. Co., Manchester, N. H.  
 Cleveland Block Co., The, 1173 W. 11th St., Cleveland, Ohio. "Braze Weld."  
 Cortland Specialty Co., 176 Railroad St., Cortland, N. Y. "Banner."  
 Diamond Metal Remedy Co., Cincinnati, Ohio. (Brass Flux.)  
 Nock, Geo. W. Co., 126 N. Fourth St., Phila., Pa. (Cast Iron.)

**BRAZING COMPOUND—Continued**

Phillips Lafitte Co., The, Phila., Pa. "Lafitte." (Brazing plates, compounds and powder.)  
 Standard Mfg. Co., 318 S. Canal St., Chicago, Ill. "Superior."  
 Taber, Arthur L., Corona, Cal. "Kastion."  
 Uebelmesser, Chas. R. Co., Inc., Bayside, L. I., N. Y. "C. R. U." (Salt.)  
 Universal Fluxine Co., Urbana, Ohio. "Universal Fluxine."  
 Wildes', Thomas Sons, 21 Maiden Lane, N. Y. City. "Semper Idem." (Brass and copper solder.)

**BRAZING FORGES**

American Gas Furnace Co., N. Y. City.  
 Black Diamond Saw & Machine Works, Nat- ick, Mass. "Vulcan Brazier." (For narrow band saws.)  
 Cast Iron Brazing & Mfg. Co., Manchester, N. H.

**BREAST DRILLS**

Ashcroft Mfg. Co., 85-89 Liberty St., N. Y. City. "Ashcroft."  
 Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Motor driven.)  
 Fray, John S. & Co., Bridgeport, Conn.  
 ★General Electric Co., Schenectady, N. Y. "G. E." (Electric.)  
 Goodell-Pratt Co., Greenfield, Mass.  
 Lancaster Machine & Knife Works, Lancaster, N. Y. "McClellan" and "Eclipse."  
 Millers Falls Co., 28 Warren St., N. Y. City. "Millers Falls."  
 Turner & Deegan, Bristol, Conn.  
 Wilkinson, A. J. & Co., 180-88 Washington St., Boston, Mass. "A. J. W. & Co."

**BROACHING MACHINES**

Burr, John T. & Sons, 429-31 Kent Ave., Brooklyn, N. Y. "Burr."  
 Consolidated Press & Tool Co., Hastings, Mich.  
 Elmes, Chas. F. Engineering Works, Cor. Morgan & Fulton Sts., Chicago, Ill. (Hydraulic.)  
 La Pointe Machine Tool Co., Hudson, Mass. (Key-seat.)  
 Motch & Merryweather Machinery Co., The, 707-715 Lakeside Ave., N. W., Cleveland, Ohio.  
 Perkins Machine Co., Warren, Mass. "Perkins."

**BRUSHES, Paint & Varnish**

Hanson & Van Winkle Co., Newark, N. J. "Rubberset." (Lacquer brushes.)  
 Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, Ohio. "Osborn."  
 Rodriguez, R. E., 56-58 Warren St., N. Y. City.

**BURNERS FOR FURNACES, OVENS, Etc.**

American Gas Furnace Co., 24 John St., N. Y. City.  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City. (Oil and gas.)  
 Tate, Jones & Co., Inc., 805 Empire Bldg., Pittsburg, Pa. "Kirkwood." (Oil and natural gas.)

★ Indicates Advertisers—see Index in back of book.

**CALIPERS & DIVIDERS**

Athol Machine Co., Athol, Mass.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Eagen, Thos. F., Worcester, Mass. "Cope-lands."  
 Goodell-Pratt Co., Greenfield, Mass.  
 Kraeuter & Co., Inc., 571-79 18th Ave., New-ark, N. J.  
 Sawyer Tool Mfg. Co., Fitchburg, Mass.  
 Slocumb, J. T. Co., 29 Oxford St., Providence, R. I. "Slocumb." (Micrometer calipers.)  
 Smith, E. G. & Co., Columbia, Pa. "Colum-bia."  
 Starrett, L. S. Co., Athol, Mass.  
 Wells Bros. Co., Greenfield, Mass. "Little Giant."

**CANS FOR FUEL & OIL**

Arrow Can Co., 35 Warren St., N. Y. City. "Basco."  
 Atlantic Stamping Co., Rochester, N. Y. (Gas-oline cans.)  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 Brown Stamping Co., Dawson St., Toledo, O.  
 Capital Hill Garage Co., The, 821 Corona St., Denver, Colo. "Capitol." (Gasoline cans.)  
 Central Stamping Co., 172-74 Fulton St., N. Y. City.  
 Consolidated Fruit Jar Co., New Brunswick, N. J. "Chaces" and "Paragon."  
 Delphos Mfg. Co., The, Delphos, Ohio. "Del-phos," "Never Leak," "C C" and "Choice." (Oil cans.)  
 Denver Auto Goods Co., The, Denver, Colo. "D. A. G." (Oil cans.)  
 ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass. (Also "Tourist" oil and gasoline kits.)  
 Harps, J. A. Mfg. Co., Greenfield, Ohio. "Never Fail." (Automatic.)  
 Iron Clad Mfg. Co., 204-6 Varet St., Brooklyn, N. Y.  
 ★Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa. "J. S. & Co." (Gasoline tanks.)  
 McClintock & Irvine Co., Neville St. & P. R. R., Pittsburg, Pa.  
 McNutt Non-Explosive Mfg. Co., 122 Morning-side Ave., E., N. Y. City. (Naphtha cans.)  
 Manufacturers' Can Co., 434 Mulberry St., Newark, N. J. "Rough Rider."  
 Rudman, C., 277 Pearl St., N. Y. City. "Auto." (Safety.)  
 Safety Fire Extinguisher Co., 29-33 West 42d St., N. Y. City. "Safety." (Gasoline cans.)  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.  
 Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."  
 Wallman Mfg. Co., 283-285 5th Ave., Milwan-kee, Wis. "Rex." (Cans, buckets & tanks.)  
 Whitaker Mfg. Co., 509 W. Monroe St., Chi-cago, Ill.  
 Wilson, F. Cortez & Co., 239-41 Lake St., Chi-cago, Ill. "Life Saver." (Oil tanks.)

**CANS, Oiling**

(See Oilers, Squirt.)

**CANS, Waste**

Arrow Can Co., 35 Warren St., N. Y. City. "Arrow."  
 Atlantic Stamping Co., Rochester, N. Y.  
 Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.  
 Central Stamping Co., 172-74 Fulton St., N. Y. City.  
 Delphos Mfg. Co., The, Delphos, O.

**CANS, Waste—Continued**

- ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass. "Safety."  
 Durlach, I., 54 Vesey St., N. Y. City.  
 Hill Dryer Co., 344 Park Ave., Worcester, Mass.  
 Iron Clad Mfg. Co., 204-6 Varet St., Brooklyn, N. Y.  
 McClintock & Irvine Co., Neville St. & P. R. R., Pittsburg, Pa.  
 New Britain Machine Co., The, New Britain, Conn.  
 Safety Fire Extinguisher Co., 29-33 W. 42d St., N. Y. City.  
 Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Nacefas."

**CARBON SCRAPERS**

- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B. & R."  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 ★Buffum Tool Co., Louisiana, Mo.  
 Mound Tool & Scraper Co., 1606-1608 N. Broadway, St. Louis, Mo. "Mound."  
 Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill.

**CAR SUPPORTS FOR GARAGES**

- ★Elite Mfg. Co., Ashland, O. "Reliable."  
 Johnstown Automobile Co., Inc., 101 Main St., Johnstown, Pa. "Betterman." (Axle stools.)  
 Pratt, Wm. E. Mfg. Co., 91 Lake St., Chicago, Ill. "Perfect."

**CASE HARDENING BONE**

- Houghton, E. F. & Co., 240 W. Somerset St., Phila., Pa. "Hydro-carbonated Bone-black."  
 Rogers & Hubbard Co., The, Middletown, Conn. "Hubbard's Black Diamond" and "Hubbard's Pameacha."

**CASE HARDENING COM-  
POUNDS**

- Blaich, Alfred O., 934-38 Pratt St., Chicago, Ill. "Blaich Modern Carbonizer." (And carbonized leather for mottle and color work.)  
 Van Doren Mfg. Co., 557-61 W. Jackson Blvd., Chicago, Ill. "V. D."

**CASE HARDENING FURNACES**

(See Annealing and Hardening Furnaces.)

**CENTER GRINDERS**

- Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Pittsburg, Pa. "Cleveland."  
 Diamond Machine Co., Providence, R. I. "American."  
 Ohio Machine Tool Co., Kenton, Ohio.  
 Stow Mfg. Co., Binghamton, N. Y.  
 Trump Bros. Machine Co., Wilmington, Del. "Trump."

**CENTERING MACHINES**

- Hendey Machine Co., Torrington, Conn. "Hendey."  
 McCabe, J. J., 30 Church St., N. Y. City.  
 National Machine Co., The, Hartford, Conn.  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Wells, F. E. & Sons Co., Greenfield, Mass.  
 Whiton, D. E. Machine Co., The, New London, Conn.

**CENTER PUNCHES**

(See Punches, Center.)

**CHAIN BLOCKS**

(See Cranes and Hoists.)

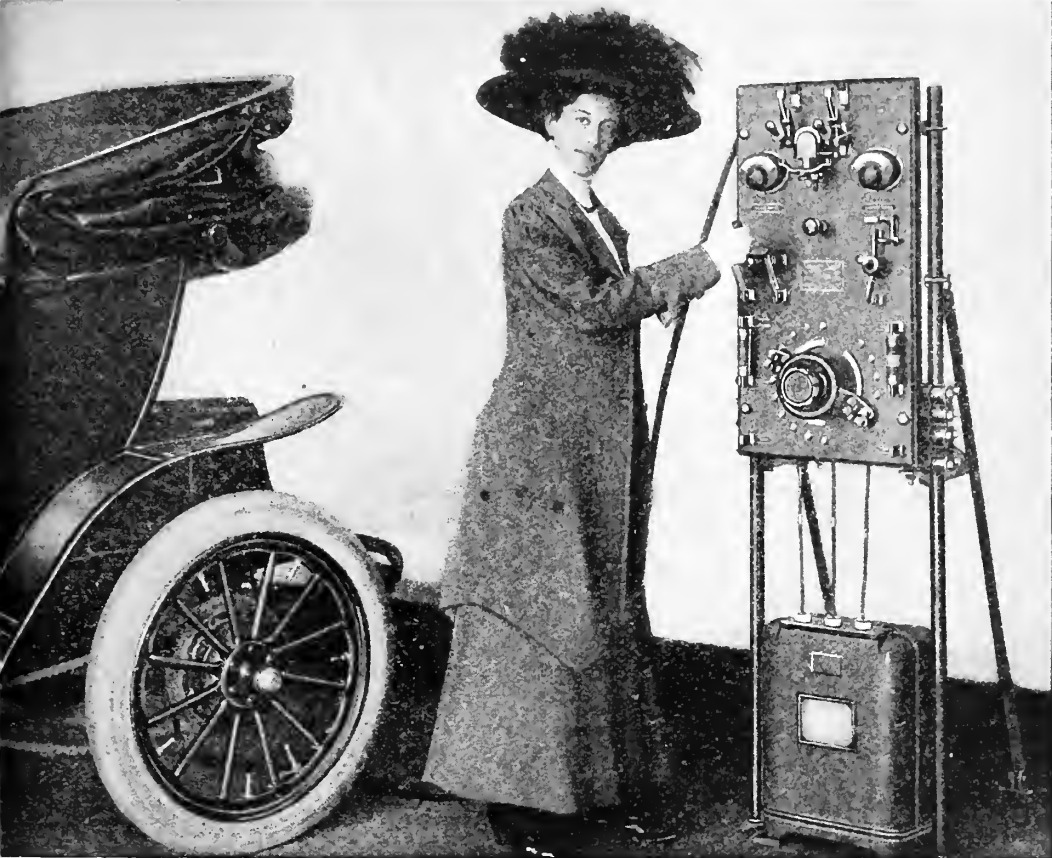
**CHAIN TOOLS**

- Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.  
 Brown, J. C. Mfg. & Garage Co., Butler, Ind. "Brown." (Ratchet.)  
 ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind.  
 Harris & Reed Mfg. Co., 1500-1518 W. 15th St., Chicago, Ill.  
 ★Motor Car Supply Co., The, 1451-55 Michigan Ave., Chicago, Ill. "Little Husky."  
 ★Never-Miss Spark Plug Co., Lansing, Mich. "Never-Miss." (Repairer.)  
 Noonan Tool & Machine Works, 103½ and 105 Dominick St., Rome, N. Y. "Noonan's."

**CHARGING APPARATUS**

(See also Ammeters, Current Rectifiers and Dynamos.)

- Abbott Mfg. Co., 2912-14 Central Ave., S. E., Cleveland, Ohio. "Cleveland" and "Abbott." (Automatic electric time switches.)  
 American Battery Co., 1132-34 Fulton St., Chicago, Ill. (Switchboards.)  
 Anderson, Albert & J. M. Mfg. Co., 289-293 A St., Boston, Mass. "Anderson." (Charging plugs and receptacles.)  
 Andrae, Julius & Sons Co., 118-20 Sycamore St., Milwaukee, Wis. "Andrae." (Charging panels and switchboards.)  
 ★Apple Electric Co., 20 N. Canal St., Dayton, Ohio. "Aplco." (Switchboard.)  
 Benjamin Electric Mfg. Co., 42 W. Jackson Blvd., Chicago, Ill. (Battery charging plug.)  
 Bissell, The F. Co., Toledo, Ohio. "Security." (Automatic time switches.)  
 Clark, James Jr. Electric Co., 520 W. Main St., Louisville, Ky. "Willey."  
 Crouse-Hinds Co., 308 W. Jefferson St., Syracuse, N. Y. (Switchboards, panel boards, porcelain receptacles, etc.)  
 Cutler-Hammer Mfg. Co., The, Milwaukee, Wis. (Charging rheostats.)  
 Dayton Electrical Mfg. Co., The, 89 St. Clair St., Dayton, Ohio. (Charging plugs.)  
 De Mooy Bros., 1831-37 E. 55th St., Cleveland, Ohio.  
 Derain Motor Co., The, 7500 Quincy Ave., Cleveland, Ohio. "Derain."  
 Diehl Mfg. Co., 90 Prince St., N. Y. City. (Generators.)  
 Dorland, Leslie C., Poughkeepsie, N. Y. "Dorland." (Automatic time switches.)  
 Economy Mfg. Co., The, Park Bldg., Pittsburg, Pa. "Perfection." (Battery chargers.)  
 Elbridge Electrical Mfg. Co., Elbridge, N. Y. "Elbridge." (Switches.)



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"Fish Systems." (Generators.)
- Garwood Electric Co., Garwood, N. J. (Switchboards.)
- Geiszler Bros. Storage Battery Co., 514-516 W. 57th St., N. Y. City. (Ignition battery rechargers.)
- ★General Electric Co., Schenectady, N. Y. "G. E." (Battery-charging panels, motor generator sets and rheostats for battery charging.)
- Helios Mfg. Co., Bridesburg, Pa. "Helios." (Charging resistances.)
- ★Holtzer-Cabot Electric Co., Boston, Mass. (Generators.)
- Kester Electric Co., 1000-1004 S. 14th St., Terre Haute, Ind. (Charging panels, switchboards and rheostats.)
- Knop Battery Co., 69 Atwater St., East Detroit, Mich. "Michigan." (Recharging boards.)
- Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna."
- Lang, J. Electric Co., 421-29 N. Lincoln St., Chicago, Ill. (Charging panels & switchboards, plugs & receptacles.)
- Marcuson, E., 521 W. 182d St., N. Y. City. "Witham." (Charging panels & switchboards, polarity indicator & charging board.)
- Metropolitan Switchboard Co., 536 W. 22d St., N. Y. City. (Charging panels & switchboards.)
- Mietz, Aug., 128-138 Mott St., N. Y. City. "Mietz."
- Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis. "Economy." (For ignition batteries.)
- ★Motsinger Device Mfg. Co., Pendleton, Ind. "Motsinger Auto-Sparker." (Charging board.)
- National Electric Supply Co., 1110-12 West Lake St., Chicago, Ill. "National." (Battery charging rheostats.)
- O'Brien Electrophone Co., Inc., Hallowell, Me. (Switchboards for boats.)
- Peerless Electric Co., The, Warren, Ohio. "Peerless." (Motor and dynamo.)
- Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill. "Phillips."
- Richardson Engineering Co., 107 Liberty St., N. Y. City.
- Robbins & Myers Co., Springfield, O. "Robbins & Myers." (Dynamo.)
- Roney & Lincoln, 132 Summit Ave., Brookline, Mass. "Stoddard." (Switchboards.)
- ★Roth Bros. & Co., 1374 W. Adams St., Chicago, Ill. "Roth." (Switchboards.)
- St. Marys Machine Co., St. Marys, Ohio. "St. Marys."
- Sprague Electric Co., 527-31 W. 34th St., N. Y. City. "Sprague."
- Stecker Electric & Machine Co., Detroit, Mich. "Stecker."

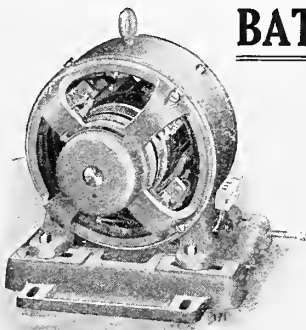
- Vivax Storage Battery Co., 2224-34 Michigan Ave., Chicago, Ill. "Vivax." (Rheostats.)
- Ward-Leonard Electric Co., The, 12 Swain St., Bronxville, N. Y. "Ward-Leonard." (Rheostats, resistances, circuit breakers and panels.)
- Western Electric Co., The, 465 West St., N. Y. City. (Charging sets, panel boards and switchboard plugs.)
- ★Westinghouse Electric & Mfg. Co., Pittsburg, Pa.
- Witherbee Igniter Co., Springfield, Mass. "Wico."

**CHAUFFEUR'S TRUCKS**

- Brown Co., The, 1071-73 S. Clinton St., Syracuse, N. Y. "Auto-Creeper."
- Cast Iron Brazing & Mfg. Co., Manchester, N. H.
- Motor & Mfg. Works Co., The, Foot of Middle St., Geneva, N. Y.
- Neville, T., Oshkosh, Wis. "Neville." (Repair truck.)
- Portland Garage, Portland, Me. "Portland."

**CHISELS**

- Anderson Forge & Machine Co., 21-31 St. Aubin Ave., Detroit, Mich.
- Atha Tool Co., Newark, N. J.
- Brewer Bros., Philadelphia, Pa.
- Buck Bros., Milbury, Mass.
- ★Buffum Tool Co., Louisiana, Mo.
- Carver Tool Works, Spring Valley, N. Y.
- Cronk & Carrier Mfg. Co., Elmira, N. Y. "Cronk."
- Dicke Tool Co., Inc., The, Downers Grove, Ill.
- Drew, C. & Co., Kingston, Mass.
- Elmore Tool Mfg. Co., The, Hartford, Conn. "Elmore."
- Greenlee Bros. & Co., Rockford, Ill. (Mortising.)
- Jennings, C. E. & Co., 42 Murray St., N. Y. City.
- Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn.
- Klein-Logan Co., Pittsburg, Pa.
- Knapp Mfg. Co., N. Y. City.
- Krauter & Co., Inc., 571-79 18th Ave., Newark, N. J.
- Mack & Co., Rochester, N. Y. "D. R. Barton." (Woodworkers.)
- Marcy Tool Works, Putnam, Conn.
- Mound Tool & Scraper Co., 1606-1608 N. Broadway, St. Louis, Mo. "Mound."
- National Cutlery Co., Detroit, Mich. "National."

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Smith, H. D. & Co., Plantsville, Conn. "S."  
Snell Mfg. Co., Fiskdale, Mass. "Snell."  
Swan, Jas. Co., Seymour, Conn.  
Syracuse Twist Drill Co., Syracuse, N. Y.  
Tuck Mfg. Co., Brockton, Mass. "Tuck."  
Vaughan & Bushnell Mfg. Co., Chicago, Ill. "H. B."  
White, L. & I. J. Co., Buffalo, N. Y.  
Wieland, Chas., 147-149 Chambers St., N. Y. City.  
Winsted Edge Tool Works, Winsted, Conn. "T. H. Witherby." (Woodworkers'.)

**CHUCKS, Boring, Planing Mill, Drill, Lathe, Magnetic, Milling Machine, Planer & Screw Machine**

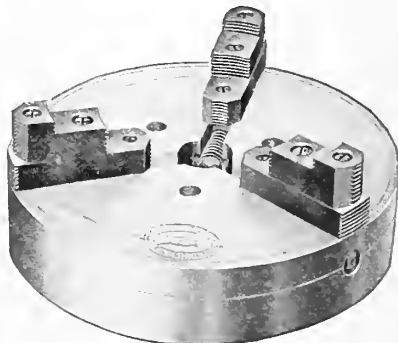
Abate, W. L., 76 W. Lincoln Ave., Mt. Vernon, N. Y. "Manufacturing." (Key & air.)  
Adjustable Collet Co., 211 High Ave., Cleveland, Ohio. "A. C." (Adjustable collet chucks, portable collet attachments, drill chucks, etc.)  
Almond, T. R. Mfg. Co., Ashburnham, Mass. "Almond." (Drill chucks.)  
American Tool & Machine Co., 109 Beach St., Boston, Mass. (Drill.)  
Brown, E. H. & Co., New Haven, Conn. "Reid." (Drill.)  
Canedy-Otto Mfg. Co., Chicago Heights, Ill. "Western Chief." (Drill.)  
Celfor Tool Co., Chicago, Ill. "Rich" and "Celfor."  
Cincinnati Chuck Co., Spring Grove Ave. & Sassafraz St., Cincinnati, O. "Cincinnati." (Lathe.)  
Cincinnati Planer Co., Cincinnati, Ohio (Planer.)  
Cleveland Chuck Co., 3848 Prospect St., Cleveland, Ohio. (Also collets and draw-in attachments.)  
Cleveland Twist Drill Co., Cleveland, Ohio. (Drill.)  
Detroit Twist Drill Co., 634-46 Fort St., W. Detroit, Mich. "Graham's." (Grooved shank system.)  
Diamond Clamp & Flask Co., Richmond, Ind. "Diamond." (Lathe.)  
Errington, F. A., 39 Cortlandt St., N. Y. City. "Errington." (Tapping.)  
Fancher Machine Co., The, Baldwinsville, N. Y. (Quick acting clutch drills for flexible shafts and machine work.)  
Goodell Mfg. Co., Greenfield, Mass. (Drill.)  
Gronkvist Drill Chuck Co., 18-20 Morris St., Jersey City, N. J. "Gronkvist." (Automatic high speed drill.)  
Hill, Clarke & Co., 156 Oliver St., Boston, Mass.  
Hoggson & Pettis Mfg. Co., New Haven, Conn. (Lathe.)  
Horton, E. & Son Co., The, Windsor Locks, Conn. "Horton."  
Jacobs Mfg. Co., The, 32 Union Place, Hartford, Conn. (Drill.)  
McCrosky Reamer Co., The, Meadville, Pa. "Wizard." (Drill.)  
Manufacturers' Equipment Co., 23-27 North Jefferson St., Chicago, Ill. "Aerochuck." (Air.)  
Modern Tool Co., Erie, Pa. "Magic." (Drill.)  
Morrow Mfg. Co., Elmira, N. Y. "Morrow." (Drill.)  
Morse Twist Drill & Machine Co., New Bedford, Mass.  
Nicholls, Wm. S., 253 Broadway, N. Y. City. "Wizard." (Lathe.)  
Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Lathe and planer.)  
Oneida National Chuck Co., Oneida, N. Y. "National." (Lathe and drill.)  
Potter & Johnston Machine Co., Pawtucket, R. I.

Radical Angular Drill & Tool Co., 119 W. 23d St., N. Y. City. "Radical."  
Reed, Francis Co., 43 Hammond St., Worcester, Mass. (Planer.)  
St. Louis Machine Tool Co., 1405 S. 7th St., St. Louis, Mo. "St. Louis." (Tapping.)  
Shepard Lathe Co., 141 W. 2nd St., Cincinnati, Ohio.  
Skinner Chuck Co., New Britain, Conn. "Skinner." (Lathe, planer and drill.)  
Standard Machinery Co., Mystic, Conn. "Coit." (Drill.)  
Standard Tool Co., Cleveland, Ohio. (Drill.)  
Trump Bros. Machine Co., Wilmington, Del. "Trump." (Drill.)  
★Union Mfg. Co., New Britain, Conn. "Union." (Drill, union, revolving jaw, turret lathe and steel.)  
Victor Tool Co., Waynesboro, Pa. (Drill.)  
Walker, O. S. & Co., 25 Union St., Worcester, Mass. "Walker." (Magnetic.)  
Warner & Swasey Co., Cleveland, Ohio.  
Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass.  
Westcott Chuck Co., Oneida, N. Y. ("Little Giant" and "Oneida" drill and "Westcott" and "I. X. L." lathe.)  
★Whitney Mfg. Co., Hartford, Conn. "Presto." (Also collets and friction tapping devices.)  
Whiton, The D. E. Machine Co., New London, Conn. (Lathe and drill.)  
Wiley & Russell Mfg. Co., Greenfield, Mass. (Drill.)

**CHUCKING MACHINES**

Brown & Sharpe Mfg. Co., Providence, R. I.  
McCabe, J. J., 30 Church St., N. Y. City.  
National Separator & Machine Co., Boston, Mass.  
★Niagara Machine Co., \$25-27 Linwood Ave., Niagara Falls, N. Y. "Ellingwood."  
Potter & Johnston Machine Co., Pawtucket, R. I. (Automatic.)

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Athol Machine Co., Athol, Mass.  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Cincinnati Tool Co., Norwood, Ohio.  
 Diamond Clamp & Flask Co., Richmond, Ind.  
 Ideal Machine Works, 255-257 39th St., Brooklyn, N. Y. "Ideal."  
 Lecount, Wm. G., South Norwalk, Conn.  
 Nicholls, William S., 253 Broadway, N. Y. City. "Ideal."  
 Noonon Tool & Machine Works, 103½-05 Dominick St., Rome, N. Y. (Chain repair clamps.)  
 Parker, John L. Co., Worcester, Mass. "Parker."  
 Phoenix Hardware Mfg. Co., Homer, N. Y. "Phoenix."  
 Sawyer Tool Mfg. Co., Fitchburg, Mass.  
 Starrett, L. S. Co., Athol, Mass. (Key-seat, measuring bar, parallel, rule and steel.)  
 Taylor, James L. Mfg. Co., Bloomfield, N. J. "Taylor."  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass.

**CLAMPS, Woodworkers'**

Advance Machinery Co., The, Toledo, Ohio.  
 ★Batavia Clamp Co., 103 Center St., Batavia, N. Y. "Colt's."  
 Black Bros. Machinery Co., Mendota, Ill.  
 Chapin-Stevens Co., Pine Meadow, Conn.  
 ★Cutter, Geo. A., Taunton, Mass. "Bay State Lightning."  
 Dann Bros. & Co., The, 80-86 Franklin St., New Haven, Conn.  
 Francis, Chas. E. Co., Rushville, Ind.  
 Grand Rapids Hand Screw Co., Grand Rapids, Mich.  
 Josef, E. E. Mfg. Co., Buffalo, N. Y.  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Palmer, A. E. & Sons, Owosso, Mich. "Palmer." (Gluing clamps.)  
 Shelden, E. H. & Co., Chicago, Ill.  
 Woodruff, The, Walter W. & Sons Co., Mt. Carmel, Conn.

**CLIPPERS, Bolt & Rivet**

(See Bolt & Rivet Clippers.)

**COLD SAWS**

(See Saws, Metal.)

**COMPRESSED AIR TANKS**

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 Air-Tight Steel Tank Co., 421 Wood St., Pittsburgh, Pa.  
 American Steel Package Co., Defiance, Ohio. "Defiance." (Steel.)  
 Baird Machine & Mfg. Co., 11 & 23 Raynor St., Detroit, Mich.  
 Bury Compressor Co., Erie, Pa.  
 Curtis & Co. Mfg. Co., Willston, Mo.

★Globe Mfg. Co., Battle Creek, Mich.  
 ★Janney, Steinmetz & Co., Phila., Pa. "J. S. & Co."  
 Koven, L. O. & Bro., 50 Cliff St., N. Y. City.  
 ★National Tube Co., Frick Bldg., Pittsburg, Pa. "Shelby."  
 Rippley Steel Boat Co., Box O, Grafton, Ill. "Rippley."  
 ★Scaife, Wm. B. & Sons Co., 221 First Ave., Pittsburg, Pa.

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 Elmore Tool Mfg. Co., Hartford, Conn.  
 Kraeuter & Co., Inc., 571-79 18th Ave., Newark, N. J.  
 Marcy Tool Works, Putnam, Conn.  
 Mound Tool & Scraper Co., 1606-1608 North Broadway, St. Louis, Mo. "Mound."  
 National Cutlery Co., Detroit, Mich. "National."  
 Nelson, A. Mfg. Co., 564 W. Randolph St., Chicago, Ill. (Combined puller and spreader.)  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y. "Noonan's."

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 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Builders' Iron Foundry, Providence, R. I.  
 Canedy-Otto Mfg. Co., Chicago Heights, Ill. "Western Chief."  
 Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.  
 Clizbe Bros. Mfg. Co., Plymouth, Ind. "Crown."  
 Crescent Machine Co., The, Leetonia, Ohio. "Crescent."  
 Diamond Machine Co., Providence, R. I.  
 Huntsville Foundry & Machine Works, Huntsville, Ala.  
 L. & D. Co., The, 88 Broad St., Boston, Mass. "Pullet." (Also belt shifters.)  
 Leiman Bros., 62 John St., N. Y. City.  
 McCabe, J. J., 30 Church St., N. Y. City.  
 Manufacturers' Equipment Co., 23-27 North Jefferson St., Chicago, Ill. (Air.)  
 Peninsular Emery Wheel Co., Detroit, Mich.  
 Wells Bros. Co., Greenfield, Mass. "Little Giant."

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Automatic Machine Co., Bridgeport, Conn.  
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Brown Clutch Co., The, Sandusky, Ohio.  
(Power Hoists.)  
Burr Mfg. Co., 2108 Superior Ave., N. Y. City.  
"Burr." (Automatic safety tackle blocks.)  
Cameron Engineering Co., 156 Berriman St.,  
Brooklyn, N. Y.  
Canton Foundry & Machine Co., 8th & Saxton  
Sts., Canton, Ohio. "The Handiest Tool  
in the Shop." (Portable.)  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Cleveland Crane & Engineering Co., Wickliffe,  
Ohio.  
Cleveland Tumbling Barrel & Mfg. Co., Cleve-  
land, Ohio.  
Curtis & Co. Mfg. Co., Willston, Mo.  
Foos Gas Engine Co., The, Springfield, Ohio.  
(Hoists.)  
Franklin Portable Crane & Hoist Co., Frank-  
lin, Pa. (Portable cranes.)

Frevert Machinery Co., 18 Dey St., N. Y. City.  
(Hand power cranes.)  
Ginter, J. M., Wooster, Ohio.  
Harrington, Edwin Son & Co., 17th & Callow-  
hill Sts., Phila., Pa.  
Hunt-Helm-Ferris & Co., Harvard, Ill. "Star."  
(Self locking.)  
Independent Pneumatic Tool Co., Thor Bldg.,  
Chicago, Ill. "Thor."  
Ingersoll-Rand Co., 11 Broadway, N. Y. City.  
"Imperial." (Pneumatic hoists.)  
Lecount, Wm. G., South Norwalk, Conn. (Ad-  
justable blocking.)  
Manning, Maxwell & Moore, Inc., N. Y. City.  
Mianns Motor Works, Mianus, Conn. "Mia-  
nus." (Gasoline hoists.)  
Milton, S. G. & Son, Franklin, Pa. (Elec-  
tric.)  
Moore, Franklin Co., Winsted, Conn. "Acme"  
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hoists.)

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 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Round, D. & Son, Cleveland, Ohio. "Simplex."  
 Schuchardt & Schutte, 90 West St., N. Y. City. "Atlas." (Chain blocks.)  
 Schutte, Alfred H., 90 West St., N. Y. City. "Velox." (Chain blocks.)  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
 Shepard Electrical Crane & Hoist Co., Montour Falls, N. Y. "Shepard."  
 Sprague Electric Co., 527-531 W. 34th St., N. Y. City. "Sprague."  
 ★Yale & Towne Mfg. Co., 9 Murray St., N. Y. City. "Y. & T."

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 Seidel, R. B., Inc., 1322 Callowhill St., Phila., Pa. "Seidel."  
 Taunton Crucible Co., Taunton, Mass.  
 Taylor, Robt. J., Inc., 1900-1916 Callowhill St., Phila., Pa.  
 Waterbury Crucible Co., The, Waterbury, Conn.

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 Como Electrical Co., Spring Lake, N. J. "Hickley."  
 ★General Electric Co., Schenectady, N. Y. "G. E."  
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 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. "D. D."  
 Sirch Electrical & Testing Laboratories, Los Angeles, Cal.  
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 Clough, R. M., Tolland, Conn. (Gear.)  
 Collmer Bros., 105 Vistula Ave., South Bend, Ind. (Cutter wheels; emery wheel dresser cutters.)  
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 National Tool Co., Cleveland, Ohio. (High speed steel cutters, gear cutters, form cutters, tap cutters & reamer cutters.)

Schellenback-Hunt Tool Co., Cincinnati, O. (Boring head, universal expanding.)  
 Shimer, Samuel J. & Sons, Milton, Pa. "Shimer."  
 Tanite Co., The, Stroudsburg, Pa. "Tanite."  
 Union Twist Drill Co., Athol, Mass. (Angular & T slot, gear & special.)

**CUTTER GRINDERS**

(See Reamer &amp; Cutter Grinders.)

**CUTTER HEADS**

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 Shimer, Samuel J. & Sons, Milton, Pa. "Shimer."

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 Armstrong Bros. Tool Co., Chicago, Ill.  
 Bignall & Keeler Mfg. Co., Edwardsville, Ill. "B & K."  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Burr, John T. & Son, 429-31 Kent Ave., Brooklyn, N. Y. "Burr."  
 Cochrane-Bly Co., Rochester, N. Y. (Cold saw.)  
 Davis, W. P. Machine Co., 257 St. Paul St., Rochester, N. Y.  
 Espen-Lucas Machine Works, 342 N. 15th St., Phila., Pa.  
 Gorton, George Machine Co., Racine, Wis.  
 Higley Machine Co., N. Y. City. (Cold saw.)  
 Hurlburt-Rogers Machine Co., South Sudbury, Mass.  
 Lea Equipment Co., 90 West St., N. Y. City. "Lea-Simplex." (Cold metal saws.)  
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 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa.  
 Nutter & Barnes Co., 326 A St., Boston, Mass.  
 Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill. (Blow-pipes.)  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Slack Mfg. Co., Springfield, Vt. (Abrasive metal cutters for high speed steel & tubing.)  
 Taylor-Shantz Co., 230 Mill St., Rochester, N. Y.

**CYLINDER GRINDERS**

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**CYLINDER BORING MACHINES**

(See Boring Machines, Metal.)

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(See Machinery Dealers.)

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 Elgin Tool Works, The, Elgin, Ill. (Dies.)  
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 Fort Dearborn Mfg. Co., 1574-80 Crossing St., Chicago, Ill. (Dies.)  
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 Granger Drop Forge Works, West 48th Ave. & 16th St., Chicago, Ill. (Dies.)  
 Heartley Machine, Variety Iron & Tool Works, 900-908 Summit St., Toledo, O.  
 Hibbard, Wm. H. Mfg. Co., Brooklyn, N. Y. (Dies.)  
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 Marbach, The F. G. Co., Medina, O. (Dies.)  
 Mayer, Charles W. Co., 10 Furnace St., Rochester, N. Y. (Dies.)  
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 ★Mossberg, Frank, Attleboro, Mass.  
 Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.  
 Pugh, Owen J., 26 Washington St., Buffalo, N. Y.  
 Reinke & Shirray Mfg. Co., 445-453 Lafayette Blvd., Detroit, Mich. (Dies.)  
 Richards, I. P. Co., 23 Pemberton St., Providence, R. I.  
 Snell Mfg. Co., Fiskdale, Mass. "Snell." (Punches.)  
 Stoll, D. H. Co., 36 Lansing St., Buffalo, N. Y.  
 Swaine, The Fred J. Mfg. Co., Springfield, O.  
 Taylor-Shantz Co., 230 Mill St., Rochester, N. Y.  
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 Zeh & Hahnemann, Ave. A & Vanderpool St., Newark, N. J.

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**DIES, Screw Cutting**

(See Taps & Dies.)

**DIE STOCKS**

(See Taps & Dies.)

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 Crescent Machine Co., The, Leetonia, Ohio. "Crescent."  
 Diamond Machine Co., Providence, R. I. "Gorton."  
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 Hoysradt & Case, Kingston, N. Y.

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 Ransom Mfg. Co., Oshkosh, Wis.  
 Rowbottom Machine Co., The, Waterbury, Conn.  
 Taylor & Fenn Co., Hartford, Conn.

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(See Calipers & Dividers.)

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(See Lathe Parts.)

**DRILL CHUCKS**

(See Chucks.)

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 American Watch Tool Co., Elm St., Waltham, Mass.  
 Baker Bros., Toledo, O.  
 Barnes, W. F. & John Co., 204 Ruby St., Rockford, Ill.  
 ★Barnes Drill Co., Rockford, Ill.  
 Barr, H. G., 21 Hermon St., Worcester, Mass. (High speed, power.)  
 Blissfield Motor Works, The, Blissfield, Mich. "Davenport." (Bench.)  
 Celfor Tool Co., Chicago, Ill. "Rich."  
 Chicago Pneumatic Tool Co., Chicago, Ill. (Pneumatic.)  
 Cincinnati Electrical Tool Co., 650 Evans St., Chicago, Ill. (Bench.)  
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 Dresses Machine Tool Co., Cincinnati, O.  
 Dwight Slate Machine Co., Hartford, Conn. (Automatic feed.)  
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 Hoefer Mfg. Co., Freeport, Ill.  
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 Ingersoll-Rand Co., 11 Broadway, N. Y. City. "Crown" & "Imperial." (Pneumatic drills.)  
 Kern Machine Tool Co., 4657-59 Spring Grove Ave., Cincinnati, O.  
 Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y. "Keystone," "Monarch" & "Weston."  
 Knight, W. B. Machinery Co., 2019 Lucas Ave., St. Louis, Mo. "Knight."

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 National Machine Co., The, Hartford, Conn.  
 Oliver, W. W. Mfg. Co., Buffalo, N. Y.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Quint, A. D., 8 Clinton St., Hartford, Conn. (Turret drills.)  
 Radical Angular Drill & Tool Co., 119 W. 23rd St., N. Y. City. "Radical." (For boring square holes.)  
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 Shepard Lathe Co., 141 W. 2nd St., Cincinnati, Ohio.  
 Silver Mfg. Co., Salem, O. "Silver."  
 Somers, Fittler & Todd Co., 327 Water St., Pittsburg, Pa.  
 Standard Railway Equipment Co., St. Louis, Mo. "Monarch." (Pneumatic drills.)  
 ★Toomey, Frank, 131 N. 3rd St., Phila., Pa.  
 Tschudi-McBarron Machine Co., The, Armory Bldg., Dayton, O. "Excelsior." (Motor & belt driven.)  
 U. S. Electrical Tool Co., 1938 W. 8th St., Cincinnati, O. (Electric bench drills.)  
 Universal Boring Machine Co., Hudson, Mass.  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass. (Hand.)  
 Wiley & Russell Mfg. Co., Greenfield, Mass. "Green River."  
 Wormer, C. C., Machinery Co., Detroit, Mich.

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(See also Twist Drills.)

- Slocumb, J. T. Co., 29 Oxford St., Providence, R. I. "Slocumb." (Combination.)

**DRILL GRINDERS**

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 Robinson Tool Works, Waterbury, Conn. "Robinson's."  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
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 Wilmarth & Morman Co., 583 Canal St., Grand Rapids, Mich. "New Yankee."

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 Clark, James, Jr., Electric Co., 520 W. Main St., Louisville, Ky. "Willey."  
 Dwight Slate Machine Co., Hartford, Conn. (Sensitive & high speed.)  
 Frevett Machinery Co., 18 Dey St., N. Y. City.  
 Garvin Machine Co., Spring & Varrick Sts., New York, N. Y.  
 Harrington, Edwin Son & Co., 17th & Callowhill Sts., Phila., Pa.  
 Henry & Wright Mfg. Co., 111-137 Sheldon St., Hartford, Conn.  
 ★Hinckley Machine Works, The, Hinckley, Ill. "Davis."  
 Hoefler Mfg. Co., Freeport, Ill.  
 Kane & Roach, Syracuse, N. Y.  
 Knight, W. B. Machinery Co., 2019 Lucas Ave., St. Louis, Mo.  
 Millers Falls Co., 28 Warren St., N. Y. City. "Universal."  
 National Separator & Machine Co., Boston, Mass. "Cylinder-Turret." (Drill.)  
 Robertson Mfg. Co., Buffalo, N. Y.  
 Sibley Machine Tool Co., South Bend, Ind. "Sibley & Ware."

**DRIP PANS, Floor**

- A-Z Co., 527-29 W. 56th St., N. Y. City.  
 ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.  
 Durlach, I., 54 Vesey St., N. Y. City.  
 Gem Mfg. Co., Chelsea Station, Boston, Mass.  
 ★Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O.  
 Hayes Mfg. Co., Maybury Grand Ave. & G. T. Ry., Detroit, Mich.  
 Hill Dryer Co., 344 Park Ave., Worcester, Mass.  
 Johnstown Automobile Co., Inc., 101 Main St., Johnstown, Pa. "Betterman."  
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 Kinsey Mfg. Co., Toledo, O.  
 Leiman Bros., 62 John St., N. Y. City.  
 Ohio Blower Co., The, 324-332 Prospect Ave., N. W., Cleveland, O.  
 Schoenborn, A. J., 109 S. 14th St., Atchison, Kans.  
 Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."

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- Electric Speedometer & Dynamometer Mfg. Co., 1317-19 New York Ave., N. W., Washington, D. C. "Dynatak."  
 Sprague Electric Co., 527-31 W. 34th St., N. Y. City. "Sprague." (For testing gas engines & other machines.)

**DYNAMOS**

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 ★Bennett-O'Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill.  
 Coles, The W. H. Sales Organization, Troy, Ohio. "No-Flicker."  
 Hanson & Van Winkle Co., Newark, N. J. "H. & V. W."  
 ★Holtzer-Cabot Electric Co., The, Boston, Mass. (Plating.)  
 Jantz & Leist Electric Co., S. E. Cor. Western Ave. & York St., Cincinnati, O.  
 Phoenix Electric Co., Mansfield, O.  
 Robbins & Myers Co., The, Springfield, Ohio. "Robbins & Myers."

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- Burke Electric Co., Erie, Pa.  
 Crocker-Wheeler Co., Ampere, N. J.  
 Eck Dynamo & Motor Co., Belleville, N. J. "Eck."  
 Elbridge Electrical Mfg. Co., Elbridge, N. Y. "Elbridge."  
 Enberg's Electrical & Mechanical Works, St. Joseph, Mich.  
 Garwood Electric Co., Garwood, N. J.  
 Jenney Electric Mfg. Co., Anderson, Ind.  
 Lincoln Electric Co., 38th St. & Kelly Ave., N. E., Cleveland, O.  
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- Robbins & Myers Co., Springfield, Ohio. "Robbins & Myers."
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- Sprague Electric Co., 527-31 W. 34th St., N. Y. City.
- Triumph Electric Co., Cincinnati, O.

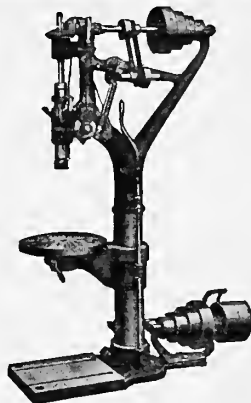
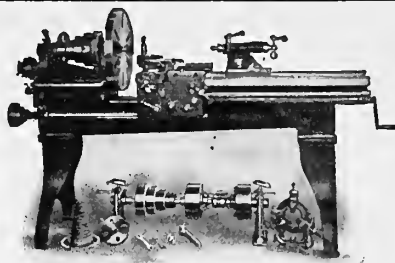
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- Crocker-Wheeler Co., Ampere, N. J.
- Diehl Mfg. Co., 90 Prince St., N. Y. City.
- Eck Dynamo & Motor Co., Belleville, N. J. "Eck."
- Garwood Electric Co., Garwood, N. J.
- ★General Electric Co., Schenectady, N. Y. "G. E."
- ★Holtzer-Cabot Electric Co., The, Boston, Mass.
- Jantz & Leist Electric Co., S. E. Cor. Western Ave. & York St., Cincinnati, O.
- Jenney Electric Mfg. Co., Anderson, Ind.
- Leiman Bros., 62 John St., N. Y. City.
- Lincoln Electric Co., 38th St. & Kelly Ave., N. E., Cleveland, O.
- Peerless Electric Co., The, Warren, O. "Peerless."
- Phoenix Electric Co., Mansfield, O.
- Reliance Electric & Engineering Co., The, Caxton Bldg., Cleveland, O. ("Lincoln" variable speed & "Reliance" constant speed.)
- Robbins & Myers Co., Springfield, O. "Robbins & Myers."
- ★Roth Bros. & Co., 1374 W. Adams St., Chicago, Ill. "Roth."
- Sprague Electric Co., 527-31 W. 34th St., N. Y. City.
- Stow Mfg. Co., Binghamton, N. Y.
- Triumph Electric Co., Cincinnati, O.
- Western Electric Co., 465 West St., N. Y. City. "Hawthorne."
- ★Westinghouse Electric & Mfg. Co., Pittsburg, Pa.

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- Albro-Clem Elevator Co., Phila., Pa.
- Cohoes Iron Foundry & Machine Co., Cohoes, N. Y.
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- ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.

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- Seaberg, Gust, 407 Douglass St., Brooklyn, N. Y. "Seaberg."
- Sedgwick Machine Works, 84-88 Carrol St., Poughkeepsie, N. Y.
- Sidney Elevator Mfg. Co., Sidney, Ohio. (Hand & power.)
- Storm Mfg. Co., 50 Vesey St., Newark, N. J.
- Warner Elevator Mfg. Co., 2600 Spring Grove Ave., Cincinnati, O.
- Wright, L. Machine Works, 9-15 Alling St., Newark, N. J.

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Elder Mfg. Co., Indianapolis, Ind. "Elder."



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- Abrasive Material Co., Phila., Pa. "Abrasive."  
(Also corundum wheels.)  
American Emery Wheel Works, Providence,  
R. I. "American." (Also corundum  
wheels.)  
Atkins, E. C. & Co., Indianapolis, Ind.  
"A.A.A." (Corundum wheels.)  
Bay State Emery Wheel Co., Worcester, Mass.  
"Bay State." (Also corundum wheels.)  
Bridgeport Safety Emery Wheel Co., Inc.,  
The, Bridgeport, Conn. (Also corundum  
& carbo-alumina wheels.)  
Buffalo Emery Wheel Co., 127 Ash St., Buf-  
falo, N. Y. (Also corundum wheels.)  
Carborundum Co., The, Niagara Falls, N. Y.  
(Carborundum wheels.)  
Challenge Machine Co., 5116 Springfield Ave.,  
Phila., Pa. "Challenge."  
Chicago Wheel & Mfg. Co., 1101-03 W. Mon-  
roe Ave., Chicago, Ill. "Chicago." (Also  
carborundum & corundum.)  
Clizbe Bros. Mfg. Co., Plymouth, Ind.  
"Crown."  
Cortland Corundum Wheel Co., Cortland, N.  
Y. (Corundum wheels.)  
Detroit Foundry Supply Co., Detroit, Mich.  
Electric Emery Wheel Co., 827 Broad St.,  
Newark, N. J. (For celluloid.)  
Gorton, Geo. Machine Co., Racine, Wis. (Ab-  
rasive discs & cement for disc grinders.)  
Grant Mfg. & Machine Co., The, 90 Silliman  
Ave., Bridgeport, Conn. "Grant." (Tool  
post grinders.)  
★Krieger Tool & Mfg. Co., 564-72 W. Randolph  
St., Chicago, Ill. "Krieger." (Grinding  
quills.)  
Modern Tool Co., Erie, Pa.  
Monarch Emery & Corundum Wheel Co.,  
Camden, N. J. (Also corundum & adam-  
ite.)  
★Oliver Machinery Co., Grand Rapids, Mich.  
Peninsular Emery Wheel Co., Detroit, Mich.  
(Also adamite & corundum wheels.)  
Ramsdell Specialty Co., West Boylston St.,  
Cor. Eame's Road, Worcester, Mass.  
Safety Emery Wheel Co., Springfield, O.  
Shepard Lathe Co., 141 W. 2nd St., Cincin-  
nati, O.  
Springfield Mfg. Co., Bridgeport, Conn.  
Star Corundum Wheel Co., Detroit, Mich.  
(Also carborundum & corundum wheels.)  
Superior Corundum Wheel Co., Waltham,  
Mass. (Also carborundum & corundum.)  
Tanite Co., The, Stroudsburg, Pa. "Tanite."  
Vitrified Wheel Co., Westfield, Mass. "Vitrif-  
ied." (Also corundum & carborundum  
wheels.)  
Waltham Emery Wheel Co., Waltham, Mass.  
(Also corundum wheels.)

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- Bay State Stamping Co., 380 Chandler St.,  
Worcester, Mass. "Bennett."  
Braunsdorf-Mueller Co., Elizabeth, N. J.  
Browne & Dowd Mfg. Co., Meriden, Conn.  
Calder, Geo. H., Lancaster, Pa. "Calder's."  
Challenge Machine Co., 5116 Springfield Ave.,  
Phila., Pa. "Gruva" & "Huntington."  
Chicago Screw Co., 1020-26 Homan Ave., Chi-  
cago, Ill. "Huntington."  
Chicago Wheel & Mfg. Co., 1101-03 Monroe St.,  
Chicago, Ill.  
Clizbe Bros. Mfg. Co., Plymouth, Ind.  
"Crown."  
Collmer Bros., 105 Vistula Ave., South Bend,  
Ind.  
Desmond-Stephan Mfg. Co., Urbana, Ohio.  
"Diamo-Carbo."  
Detroit Emery Wheel Co., Detroit, Mich.  
"Hart."  
Diamond Saw & Stamping Works, Buffalo, N.  
Y. "Sterling."  
★Heald Machine Co., Worcester, Mass. "Met-  
calf."  
Robson Mfg. Co., Galesburg, Ill.

Sterling Machine & Stamping Co., Wellin-  
ton, O.  
Tanite Co., The, Stroudsburg, Pa. "Tanite."  
Warren Axe & Tool Co., Warren, Pa. "Hun-  
tington." (Dresser & cutter.)

**ENGINE LATHES**

(See Lathes.)

**ENGINE TESTING DEVICES**

Tracy, Jos., 116 W. 39th St., N. Y. City.

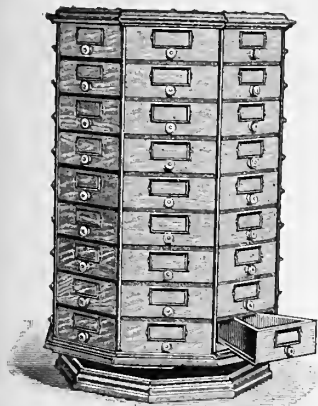
**EXPANDERS, Boiler Tube**

(See Boiler Tube Expanders.)

**FACTORY EQUIPMENT, Miscel-  
laneous**

- (See also Transmission Appliances.)  
Abernathy Vise & Tool Co., Chicago, Ill.  
(Work benches.)  
★American Bolt & Screw Case Co., Dayton, O.  
(Revolving cases for bolts, screws, etc.)  
Art Metal Construction Co., Jamestown, N. Y.  
(Metal lockers.)  
Athol Machine Co., Athol, Mass. (Grindstone  
stands.)  
Barnett, Oscar Foundry Co., Newark, N. J.  
(Sprue cutters & foundry flasks.)  
Bridgewater Machine Co., The, 31-35 Cherry  
St., Akron, O. (Core stands.)  
Cameron Engineering Co., 156 Berriman St.,  
Brooklyn, N. Y. (Overhead tramways &  
ball bearing trolleys.)  
Central Iron Works, 200-209 S. Front St.,  
Quincy, Ill. (Industrial cars, industrial  
track systems.)  
Cleveland Wire Spring Co., Cleveland, Ohio.  
(Steel shop boxes, barrels, shelving & tool  
racks, stock room equipment & tote  
boxes.)  
★Davis Mfg. Co., 15th St. & Park Ave., Milwau-  
kee, Wis. "Davis." (Steel storage bins &  
shelving.)  
Detroit Steel Product Co., 91-99 East Fort St.,  
Detroit, Mich. "Detroit-Fenestra."  
(Window sashes.)  
★Dover Stamping & Mfg. Co., 385 Putnam Ave.,  
Cambridge, Mass. (Garage rubbish bar-  
rels.)  
Durand-Steel Locker Co., 1244 American Trust  
Bldg., Chicago, Ill. "Durand." (Steel  
lockers & tables.)  
Fancher Machine Co., The, Baldwinsville, N.  
Y. (Overhead trolleys.)  
Federal Steel Fixture Co., 4545 W. Homer St.,  
Chicago, Ill. "Federal." (Steel lockers,  
shelving, filing cabinets, boxes & barrels.)  
Flather, The Mark, Planer Co., Nashua, N. H.  
(Reaming stands.)  
Frevort Machinery Co., 18 Dey St., N. Y. City.  
General Fire Proofing Co., Youngstown, Ohio.  
"Allsteel." (Steel clothing lockers & con-  
crete reinforcement for erection of factory  
buildings.)  
Gilmer, L. H. Co., 52 N. 7th St., Phila., Pa.  
(Woven endless abrasive belts for metal &  
wood finishing.)  
Grand Rapids Hand Screw Co., Grand Rapids,  
Mich. (Work benches.)  
Greenlee Bros. & Co., Rockford, Ill. (Machin-  
ists' benches & tool racks.)  
Hardinge Bros., 3133-41 Lincoln Ave., Chicago,  
Ill. "Beyer." (Watchmen's portable  
clocks.)  
Harrington, Edwin Son & Co., 17th & Callow-  
hill Sts., Phila., Pa. (Overhead travelers  
& track systems.)  
Hart & Cooley Co., New Britain, Conn. "H  
& C." (Lockers.)

★ indicates Advertisers—see Index in back of book.



## REVOLVING CASES

for small parts for Automobiles—bolts, screws, etc. Just what you want. Occupy small space. Capacity very large. Substantially made and well finished. Every case guaranteed. Thousands of them in use. Made in many sizes and finishes. Send for Catalogue.

**American Bolt & Screw Case Co.**  
Dayton, Ohio, U. S. A.

### FACTORY EQUIPMENT, Miscellaneous — Continued

- Hoggson & Pettis Mfg. Co., New Haven, Conn. (Clamps.)
- Johnstown Automobile Co., Inc., 101 Main St., Johnstown, Pa. "Betterman." (Steel trestles, armature stands & vise supporters.)
- Kalamazoo Steel Goods Co., Kalamazoo, Mich. "Kalamazoo." (Stools & chairs.)
- Leiman Bros. 62 John St., N. Y. City. (Vise benches, work benches, wash basins.)
- Lyon Metallic Mfg. Co., Aurora, Ill. "Lyon." (Lockers, steel racks, boxes, barrels, tables & tool boxes.)
- Manufacturing Equipment & Engineering Co., 209 Washington St., Boston, Mass. (Lockers, stoves, chairs & other shop & factory specialties.)
- Merritt & Co., N. W. Cor. Front & Arch Sts., Camden, N. J. (Lockers, shelving & bins.)
- New Britain Machine Co., The, New Britain, Conn. "New Britain." (Portable vise stands, tool racks, lathe racks, shelving, bench legs, bench drawers, steel stock racks.)
- ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich. (Track systems & trolleys.)
- Ohio Mfg. Co., The, Painesville, Ohio. (Steel shop boxes, barrels, kegs, racks, stools, shelving & tool cupboards.)
- ★Oliver Machinery Co., Grand Rapids, Mich. (Work benches.)
- Shelden, E. H. & Co., Chicago, Ill. (Work benches.)
- Smith, F. P., Wire & Iron Works, 100-02 Lake St., Chicago, Ill. (Metal lockers.)
- Terrell's Equipment Co., Victoria & Wills Sts., Grand Rapids, Mich. (Metal lockers, steel shelving & steel boxes.)
- Toles, W. C. Co., 4034-36 N. 42nd St., Irving Park, Chicago, Ill. (Benches.)
- Van Dorn Iron Works Co., The, Cleveland, O. "Van Dorn." (Metal lockers, steel shelves, tote boxes, shop bins, bench drawers, storage racks & metal office furniture.)
- Walker Foundry Co., Erie, Pa. (Bench legs.)
- Western Tool & Mfg. Co., The, Springfield, Ohio. "Champion." (Vise & tool stands & movable benches.)
- Williamson Vise Co., Bradford, Pa. (Machine tables.)
- ★Yale & Towne Mfg. Co., 9 Murray St., N. Y. City. (Trolleys & tramways.)

### FANS

- American Blower Co., Detroit, Mich. "A.B.C." & "Sirocco."
- Buffalo Forge Co., Buffalo, N. Y. "Buffalo."
- Champion Blower & Forge Co., Lancaster, Pa. "Champion." (Fan blowers & exhaust fans.)
- New York Blower Co., Chicago, Ill.

### FAUCETS

Haydenville Co., The, Haydenville, Mass.

Wilton Sales Co., Wrightsville, Pa. (Latching & locking, for tanks & barrels.)

### FILES & RASPS

- Akron File Co., Akron, O.
- American File Sharpener Co., 287 Broadway, N. Y. City. "Trojan."
- American Swiss File & Tool Co., 24 John St., N. Y. City. "American Swiss." (Tool-makers.)
- Barnett, G. & H. Co., Phila., Pa. "Black Diamond."
- Carver File Co., Phila., Pa. "Delta."
- Chelsea File Works, Norwich, Conn. "Chelsea."
- Colonial File Co., 167-70 Teneau St., Neponset, Mass. "Colonial" & "Puritan."
- Gem City File Works, Quincy, Ill.
- Graves File Works, Newark, N. J.
- Hayes File Co., 474-78 Franklin St., Detroit, Mich.
- Heller Bros. Co., 865 Mt. Prospect Ave., Newark, N. J. "Heller's."
- Liveright Bros., Phila., Pa. "Gold Medal."
- Madden & Morrison File Co., Middletown, N. Y.
- National File & Tool Co., 2110 Allegheny Ave., Phila., Pa. "Vixen."
- Nicholson File Co., Providence, R. I. "Nicholson," "American," "Arcade," "Great Western," "Kearney & Foot," "Eagle," "McClellan," "J. Barton Smith" & "X.F."
- Pancoast, Henry B. Co., 2110 Allegheny Ave., Phila., Pa. "Vixen."
- Rex File & Saw Co., Newcomerstown, Ohio. "Rex."
- Reynolds Bros. Columbus, O.
- Simonds File Co., Fitchburg, Mass. "Simonds" & "Fitchburg."
- Simplex Mfg. Co., The, 90 West St., N. Y. City. "Simplex."
- Stokes Bros. Mfg. Co., Freehold, N. J. (Rasps.)
- Troy File Works, Troy, N. Y. "Trojan."
- Westphal, F. & Co., Milwaukee, Wis. "F. Westphal & Co." & "Milwaukee."
- Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "Eagle" & "Madden."

### FILE HANDLES

- American File Sharpener Co., 287 Broadway, N. Y. City. "Best."
- Bliss, R. Mfg. Co., Pawtucket, R. I.
- Cassady-Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.
- Chaplin-Stevens Co., Pine Meadow, Conn.
- Niagara Handle & Ferrule Co., 321 N. Holliday St., Baltimore, Md. "Neversplit."
- Ohio Tool Co., Columbus, O.
- Piqua Handle & Mfg. Co., The, Piqua, O.
- Sandusky Tool Co., Sandusky, O.
- Simonds File Co., Fitchburg, Mass. "Simonds" & "Fitchburg."
- Troy File Works, Troy, N. Y. "Best."

★ indicates Advertisers—see Index in back of book.

**FLEXIBLE SHAFTS**

Fancher Machine Co., The, Baldwinsville, N. Y.

**FLY-WHEEL PULLERS**

(See Wheel Pullers.)

**FORGES**

Baldwin, Tuthill & Bolton, Grand Rapids, Mich.  
 Boynton & Plummer, 54 Hermon St., Worcester, Mass.  
 Bradley, C. C. & Son, 432 N. Franklin St., Syracuse, N. Y. "Bradley."  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Canedy-Otto Mfg. Co., Chicago Heights, Ill. "Royal" & "Western Chief."  
 Champion Blower & Forge Co., Lancaster, Pa. "Champion."  
 Chapman Engine Works, Marcellus, Mich. (Portable.)  
 Chicago Pneumatic Tool Co., Chicago, Ill. (Air.)  
 Cleveland Steam Gauge Co., 1566 Merwin Ave., N. W., Cleveland, O.  
 Harvey, Arthur C. Co., 374 Congress St., Boston, Mass. "Buffalo."  
 Leiman Bros., 62 John St., N. Y. City.  
 New York Blower Co., Chicago, Ill.  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.  
 Silver Mfg. Co., Salem, Ohio. "Silver." (Portable.)

**FORMING MACHINES**

Baird Machine Co., The, Oakville, Conn. (Wire & sheet metal.)  
 Blake & Johnson Co., Thomaston Ave., Waterbury, Conn. (Wire.)  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Manville Bros. Co., Waterbury, Conn. "Manville." (Automatic wire & metal.)  
 Manville, E. J. Machine Co., Waterbury, Conn. (Wire.)

**FOUNDRY EQUIPMENT**

Adams Co., The, Dubuque, Iowa "Adams." (Sprue cutters, snap flasks & foundry supplies.)  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Snap flasks.)  
 Barnett, Oscar Foundry Co., Newark, N. J. (Sprue cutters & foundry flasks.)  
 Bartley, Jonathan Crucible Co., Trenton, N. J. (Stirrers, stoppers, retorts, etc.)  
 Bigelow Co., New Haven, Conn. (Foundry cupolas.)  
 Brand, S. H. Co., Chicago, Ill. ("Superior" parting & "Eureka" wax wire core vent.)  
 Brass Founders' Supply Co., Newark, N. J. (Sprue cutters, foundry flasks, clamps & supplies for brass foundries.)  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Burdick & Son, Albany, N. Y. (Chaplets.)  
 Byram & Co., Inc., Detroit, Mich. (Cupolas, ladles, cranes, foundry cars, core oven cars, crucible tongs & shanks.)  
 Central Foundry Supply Co., West Spring St. & H. V. Ave., Columbus, Ohio "Acme" (Parting chaplets, facings, etc.)  
 Central Iron Works, 200-209 S. Front st., Quincy, Ill. (Water cinder mills, dust arresters & core cars.)  
 Cleveland Chaplet & Mfg. Co., Cleveland, O. (Chaplets.)  
 Detroit Foundry Supply Co., Detroit, Mich. (Foundry facings, steel & brass foundry supplies, molding sand, etc.)

Diamond Clamp & Flask Co., Richmond, Ind. "Diamond." (Core machines, foundry flasks & slip jackets.)  
 Foundry Specialty Co., The, Cincinnati, Ohio. "Partine." (Parting sand for moulds); "Fluxine." (for cleaning brass.)  
 Goldschmidt Thermit Co., 90 West St., New York, N. Y. "Thermit."  
 Hill & Griffith Co., The, 1248-62 State Ave., Cincinnati, Ohio. "Peerless." (Perforated chaplets, foundry facings, wax wire, "Ebony" core compound, glutrin, plumbago and foundry supplies.)  
 Holland Linseed Oil Co., Chicago, Ill. (Core compounds.)  
 Hollands Mfg. Co., Erie, Pa. (Melting pots & ladles.)  
 Ingersoll-Rand Co., 11 Broadway, N. Y. City. "Crown." (Pneumatic Sand Rammers.)  
 Leiman Bros., 62 John St., N. Y. City. (Casting flasks, crushing machines, ingot moulds & pickle pots.)  
 Lindsay, W. W. & Co., Phila., Pa. (Chaplets.)  
 Littleford Bros., 453-7 E. Pearl St., Cincinnati, Ohio. (Core ovens, ladles, etc.)  
 McCormick, J. S. Co., Pittsburg, Pa. (Foundry facings, cupolas, parting material, moulding sand & core oil.)  
 McCullough-Dalzell Crucible Co., Pittsburg, Pa. (Phosphorizers, ladle stoppers, plumbago & crucible covers.)  
 McNeil, Jas & Bro. Co., Pittsburg, Pa. (Cupolas & ladles.)  
 Macgowan & Finigan Foundry & Machine Co., St. Louis, Mo. "Newton." (Pulverizer & roller.)  
 Macphail Flask & Machine Co., Fort Madison, Iowa. "Macphail." (Steel flasks.)  
 Middleditch, B., Detroit, Mich. (Flasks; foot & power sprue cutters.)  
 Millett Core Oven Co., Springfield, Mass. (Core baking ovens.)  
 Mills, H. E. Mfg. Co., Syracuse, N. Y. "Mills." "Dry Core Compounds" & "Syracuse" (liquid core compounds, core wash, lead, parting compounds, etc.)  
 Monarch Engineering & Mfg. Co., 1200-1206 American Bldg., Baltimore, Md. (Burners.)  
 Moussette, O. J. Co., Inc., Driggs Ave. & N. 10th St., Brooklyn, N. Y. "Monarch." (Crusher & pulverizer.)  
 ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich. "Newton." (Cupolas, ladles, etc.)  
 Obermayer, S., Co., Cincinnati, Ohio.  
 Paxson, J. W. Co., 1019 N. Delaware Ave., Phila., Pa. (Magnetic metal separators, foundry facings & supplies.)  
 Robeson Process Co., Au Sable Forks, N. Y. "Robeson." (Glutrin.)  
 Seidel, R. B., Inc., 1322 Callohill St., Phila., Pa. "Seidel." (Ladle stoppers & nozzles.)  
 Smith, The J. D. Foundry Supply Co., Cor. Scranton & Carter Roads, N. W., Cleveland, Ohio. (Foundry facings, blackings & supplies.)  
 Smith & Caffrey Co., Syracuse, N. Y. "Eureka." (Flasks.)  
 Smith, Edward F. & Co., 256 State St., New Haven, Conn. (Dipping baskets.)  
 Sterling Wheel Barrow Co., Milwaukee, Wis. (Foundry flasks.)  
 Stevens, Frederick B., Detroit, Mich. ("King Kore Compound," "Stevens' Core Gum" & "Core Oil" core compounds; cupolas, foundry riddles & sieves, plumbago, Stevens' carbon blacking & sea coal facing.)  
 Swoboda, L. J., 96 Warren St., N. Y. City. "Lycopart." (Foundry partings.)  
 Taylor & Dean, Pittsburg, Pa. (Foundry riddles & sieves.)  
 Toledo Machine & Tool Co., The, Toledo, Ohio. (Sprue cutters.)  
 Turner Machine Co., 2049 N. Second St., Phila., Pa. (Sand sifters & gate cutters.)  
 United States Chaplet & Supply Co., 140 Cedar St., N. Y. City. (Chaplets.)  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass. (Melting ladles.)

## FUNNELS

- Browne's Automatic Funnel Bucket Co., 3219 S. Figueroa St., Los Angeles, Cal. "Browne." (Bucket.)  
 Central Stamping Co., 172-74 Fulton St., N. Y. City.  
 ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass. (Also combination measures & funnels & automatic gasoline shut off funnels.)  
 Gilbert & Barker Mfg. Co., 80 & 82 Fourth Ave., N. Y. City. "Breeze." (Filter funnel.)  
 Hill Dryer Co., 344 Park Ave., Worcester, Mass.  
 Johnson's, Iyer Sporting Goods Co., 163 Washington St., Boston, Mass. (Filter funnels.)  
 Knapp Mfg. Co., N. Y. City.  
 No-Shammy Co., 5711 Hough Ave., N. E., Cleveland, O. "No-Shammy." (Separator.)  
 Perfection Supply Co., Detroit, Mich. "Perfection."  
 Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."  
 Taliaferro, Whitmell T., 258 Broadway, N. Y. City. "Index."  
 Vogel, Wm. & Bros., 37 S. 9th St., Brooklyn, N. Y.  
 Wallman Mfg. Co., 283-85 5th Ave., Milwaukee, Wis. (Filter funnels.)  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Hurriup."

- Goodell-Pratt Co., Greenfield, Mass.  
 Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.  
 Rose, J. A., Hastings, Neb. "Rose."  
 Smith, Otis A., Rockfall, Conn. (Washer cutters.)  
 Stortz, John & Son, 210 Vine St., Phila., Pa.

## GASOLINE CANS

(See Cans for Fuel.)

## GAUGES, Measuring

- Athol Machine Co., Athol, Mass. (Center & screw pitch.)  
 Blodgett Mfg. Co., Rochester, N. Y. (Screw pitch, twist drill & wire.)  
 Brown & Sharpe Mfg. Co., Providence, R. I. (Wire, plate, depth & pitch.)  
 Chapin-Stevens Co., Pine Meadow, Conn.  
 ★General Electric Co., Schenectady, N. Y. "G. E."  
 Goodell-Pratt Co., Greenfield, Mass. (Center, depth, screw pitch & surface.)  
 Gronkvist Drill Chuck Co., 18-20 Morris St., Jersey City, N. J. "Johannson's."  
 Marbach, F. G., Medina, Ohio. (Concave & convex.)  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Rogers, John M. Works, Gloucester City, N. J. (Standard internal & external cylindrical.)  
 Sawyer Tool Mfg. Co., Fitchburg, Mass. (Centre, depth, caliper, thread & screw pitch.)  
 Schellenberg-Hunt Tool Co., Cincinnati, Ohio. (Surface.)  
 Starrett, L. S. Co., Athol, Mass. (Center testers, caliper, center, circumference, depth, drill, tap & wire, fillet, height, hub, radius, screw pitch & thickness gauges.)  
 Wells Bros. Co., Greenfield, Mass. "Little Giant."  
 Wyke, J. & Co., Boston, Mass. (Center & surface.)

## FURNACES

(See also Annealing Furnaces & Metal Melting Furnaces.)

- Byram & Co., Inc., Detroit, Mich. (Brass melting.)  
 Englehard, Chas., 32 Cortlandt St., N. Y. City. "Heraeus." (Imported.)  
 Leavitt, C. W. & Co., Cortlandt Bldg., 30 Church St., N. Y. City. "Girod." (Electric.)  
 Leiman Bros., 62 John St., N. Y. City.  
 McNeil, Jas. & Bros. Co., Pittsburg, Pa. (Blast.)  
 Macleod, Walter & Co., Cincinnati, Ohio. "Buckeye." (Oil.)  
 Monarch Engineering & Mfg. Co., 1200-1206 American Bldg., Baltimore, Md. (Welding furnaces.)  
 Rockwell, W. S. Co., 50 Church St., N. Y. City. (Brazing, enameling, galvanizing, japanning, etc.)  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City. (Brazing, welding, heating, hardening & tempering furnaces; enameling & japanning ovens.)  
 Tate, Jones & Co., Inc., 806 Empire Bldg., Pittsburg, Pa. (Heating & tempering.)  
 U. S. Gas Furnace Co., 143 Eddy St., Providence, R. I.

## FURNACES, Soldering

- Best Light Co., The, Canton, O. "Best."  
 Clayton & Lambert Mfg. Co., Detroit, Mich.  
 Detroit Heating & Lighting Co., 340 Wight St., Detroit, Mich. (Fire pots.)  
 Jacobson Machine Mfg. Co., Warren, Pa. "Superior."  
 Knapp Mfg. Co., N. Y. City.  
 Leiman Bros., 62 John St., N. Y. City. (Soldering lamps.)  
 Schneider & Trenkamp Co., East 40th St. & Penna. R. R., Cleveland, Ohio. "Reliable."

## GASKET & WASHER CUTTERS

- Bonney Vise & Tool Works, Allentown, Pa. "Bonney."  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 Cincinnati Tool Co., Norwood, Ohio. "Har-graves."

## GEAR CUTTING MACHINERY

- American Watch Tool Co., Elm St., Waltham, Mass.  
 Bilgram Machine Works, 1235 Spring Garden St., Phila., Pa.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Cincinnati-Bickford Tool Co., The, Spring Grove Ave. & Township St., Cincinnati, Ohio.  
 ★Cincinnati Gear Cutting Machine Co., Cincinnati, O. (Spur.)  
 Dwight Slate Machine Co., Hartford, Conn.  
 Fellows Gear Shaper Co., The, Springfield, Vt. "Fellows."  
 Flather, E. J. Mfg. Co., Nashua, N. H. "Flather." (Automatic.)  
 Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
 Gear Grinding Machine Co., Detroit, Mich. "Ward." (Gear grinding machines.)  
 Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J. (Also rack cutting machines.)  
 Harrington, Edwin Son & Co., 17th & Callowhill Sts., Phila., Pa.  
 Hill, Clarke & Co., 156 Oliver St., Boston, Mass.  
 Lees-Bradner Co., Schofield Bldg., Cleveland, Ohio.  
 McCabe, J. J., 30 Church St., N. Y. City.  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 Manning, Maxwell & Moore, Inc., N. Y. City.  
 Marshall & Hushart Machinery Co., 11-15 N. Canal St., Chicago, Ill.

★ indicates Advertisers—see Index in back of book.

**GEAR CUTTING MACHINERY—Continued**

Morse Twist Drill & Machine Co., New Bedford, Mass. (Drill wire, plug & ring.)  
 Motch & Merryweather Machinery Co., 707-15 Lakeside Ave., N. W., Cleveland, O.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa.  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Reynolds Machine Co., Moline, Ill. "Reynolds."  
 Standard Mfg. Co., Bridgeport, Conn.  
 Walcott & Wood Machine Tool Co., Jackson, Mich. (Rack cutting machines.)  
 Whiton, The D. E. Machine Co., New London, Conn.

**GEAR HOBGING MACHINES**

Adams Co., The, Dubuque, Iowa. "Farwell." (Automatic.)  
 Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J. (For spur, worm & spiral gears.)  
 ★Grant-Lees Machine Co., 6901 Quincy Ave., Cleveland, O.  
 Lees-Bradner Co., Schofield Bldg., Cleveland, Ohio. (Worm.)  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa. (Worm.)  
 Schuchardt & Schutte, 90 West St., N. Y. City. (Also tooth rounding machines.)  
 Schutte, Alfred H., 90 West St., N. Y. City. "Rhenania."

**GREASE CUP FILLERS**

Tell City Foundry & Machine Works, Tell City, Iowa. "Goul."

**GRINDERS**

(See also Disk, Internal, Piston Ring, Plain, Tool, Portable, Reamer & Cutter, Surface & Universal Grinders.)  
 Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill. (Combination vise, grinding, drilling machine, etc.)  
 Alpena Industrial Works, Alpena, Mich. (Knife.)  
 American Wood Working Machinery Co., Rochester, N. Y. (Knife.)  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Knife lap.)  
 ★Bennett-O'Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill. (Electric.)  
 Bentel & Margedant Co., The, Hamilton, O. "Hamilton." (Knife & emery.)  
 Blake & Johnson Co., Thomaston Ave., Waterbury, Conn. (Emery.)  
 Blount, G. J. Co., Everett, Mass. (Dry grinders.)  
 Bridgeport Safety Emery Wheel Co., The, Inc., Bridgeport, Conn.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Bryant Chucking Grinder Co., Springfield, Vt. (Chucking.)  
 Buffalo Emery Wheel Co., 127 Ash St., Buffalo, N. Y. (Foot & power.)  
 Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.  
 Calder, Geo. H., Lancaster, Pa.  
 Canton Foundry & Machine Co., Eighth and Saxton Sts., Canton, O. "Universal."  
 Chapman Engine Works, Marcellus, Mich. "Chapman." (Emery, foot power.)  
 Chicago Machine Tool Co., Chicago, Ill.  
 Cincinnati Electrical Tool Co., 650 Evans St., Cincinnati, O.  
 Clark, James, Jr., Electric Co., 520 W. Main St., Louisville, Ky. "Willey."  
 Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Cleveland, O. "Cleveland." (Pneumatic emery & valve grinding machines.)

Clizbe Bros. Mfg. Co., Plymouth, Ind. "Crown." (Foot & hand.)  
 Detroit Emery Wheel Co., Detroit, Mich.  
 "Hart" & "Detroit."  
 Diamond Machine Co., Providence, R. I. "Diamond."  
 Emmert Mfg. Co., Waynesboro, Pa. (Face.)  
 Fancher Machine Co., The, Baldwinville, N. Y. (Emery.)  
 Foote-Burt Co., 41st & St. Clair Ave., Cleveland, O. (Valve.)  
 Frevert Machinery Co., 18 Dey St., N. Y. City. (Emery.)  
 Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
 ★General Electric Co., Schenectady, N. Y. "G. E." (Electric buffer and grinder.)  
 ★Heald Machine Co., 14 New Bond St., Worcester, Mass.  
 Hill, Clarke & Co., 156 Oliver St., Boston, Mass.  
 ★Holtzer-Cabot Electric Co., The, Boston, Mass. (Electric.)  
 Huntsville Foundry & Machine Works, Huntsville, Ala.  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor."  
 Landis Tool Co., Waynesboro, Pa. (Crank.)  
 Leiman Bros., 62 John St., N. Y. City.  
 Leland, W. H. Co., Worcester, Mass.  
 Marshall & Hushart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
 Mitts & Merrill, Saginaw, Mich. (Edging.)  
 Motch & Merryweather Machinery Co., The, 705-15 Lakeside Ave., N. W., Cleveland, O.  
 Nicholls, William S., 253 Broadway, N. Y. City. "Economy." (Emery.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 O. K. Tool Holder Co., Shelton, Conn. "O K." (Disc.)  
 Oesterlein Machine Co., The, Cincinnati, O. "Oesterlein." (Universal, combination, universal cutter & tool grinder.)  
 Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O. "Osborn." (Emery.)  
 Peninsular Emery Wheel Co., Detroit, Mich. "Peninsular."  
 Pike Mfg. Co., Pike, N. H. "Pyko." (Hand & foot.)  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Automatic sizing.)  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Ransom Mfg. Co., Oshkosh, Wis. (Motor driven.)  
 Rivett Lathe Mfg. Co., Brighton, Boston, Mass.  
 ★Roth Bros. & Co., 1374 W. Adams St., Chicago, Ill. "Roth." (Electric.)  
 Safety Emery Wheel Co., Springfield, O.  
 Schuchardt & Schutte, 90 West St., N. Y. City. (Cam & hob.)  
 Superior Corundum Wheel Co., Waltham, Mass.  
 Tanite Co., The, Stroudsburg, Pa. "Tanite." (Planer knife grinders & saw gummers.)  
 Tindel-Morris Co., Eddystone, Pa. (Crankshaft.)  
 Tucker Machine Co., 224 E. 9th St., Cincinnati, Ohio.  
 Turner Machine Co., 2049 N. Second St., Phila., Pa. (Cock.)  
 U. S. Electrical Tool Co., 1938 W. 8th St., Cincinnati, O. (Electric.)  
 Van Benschoten, John, 14-20 Catharine St., Poughkeepsie, N. Y. "Van Benschoten."  
 Warner & Swasey Co., Cleveland, O.  
 Washburn Shops of the Worcester Polytechnic Institute, The, Worcester, Mass. "Worcester." (Bench & floor.)  
 Webster & Perks Tool Co., Springfield, O. (Emery.)  
 Western Electric Co., The, 465 West St., New York, N. Y. "Hawthorne." (Motor driven.)  
 White, John A. Co., Dover, N. H. (Knife.)  
 Zacharias Garage Co., Eagle Hall, Asbury Park, N. J. "Zacharias." (Skate & lawn mower.)

# BUY THE HAMMER OF QUALITY

MACHINISTS' BALL PEIN HAMMERS

FULL FINISH

½ Dozen in each box.

FULL FINISH

THE BEST MODERATE PRICED TOOL



Forged from Bar Tool Steel

Made in Weights from 3 lbs. to 4 oz.

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H. CHENEY HAMMER CO., Little Falls, N. Y., U. S. A.

## GRINDING WHEELS

Abrasive Material Co., Phila., Pa.  
Norton Grinding Co., Barbers Crossing, Worcester, Mass. "Norton."

## HACK SAWS, Hand

(See Saws, Metal.)

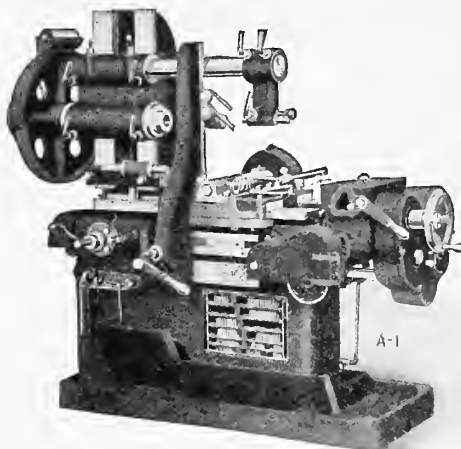
## HACK SAWS, Power

- Armstrong-Blum Mfg. Co., 339-57 N. Francisco Ave., Chicago, Ill. "Marvel."
- Atkins, E. C. & Co., Indianapolis, Ind. "Atkins Kwik Kut."
- ★Buffalo Specialty Co., 357-77 Ellicott St., Buffalo, N. Y. "Duplex."
- Clark, James, Jr., Electric Co., 520 W. Main St., Louisville, Ky. "Willey."
- Cleveland Block Co., The, 1173 W. 11th St., Cleveland, O. "Cleveland."
- Dayton Machine Works, Dayton, O. "Victor."
- Diamond Saw and Stamping Works, Buffalo, N. Y.
- ★Eclipse Machine Co., Elmira, N. Y. "Eclipse."
- Garvin Machine Co., Spring & Varrick Sts., N. Y. City.
- Goodell-Pratt Co., Greenfield, Mass.
- Grant Mfg. & Machine Co., The, 90 Silliman Ave., Bridgeport, Conn. "K-B."
- Greenlee Bros. & Co., Rockford, Ill. "Greenlee."
- Hoefler Mfg. Co., Freeport, Ill.
- Leiman Bros., 62 John St., N. Y. City.
- Millers Falls Co., 28 Warren St., N. Y. City. "Star."
- ★Motor Parts Co., Plainfield, N. J. "Motart." (Circular.)
- Niles-Bement-Pond Co., 111 Broadway, N. Y. City.
- Racine Gas Engine Co., Racine Junction, Wis. "Racine."
- Robertson Mfg. Co., Buffalo, N. Y.
- Simplex Mfg. Co., The, 90 West St., N. Y. City. "Simplex."
- Story, H. T., 122 N. Curtis St., Chicago, Ill. (Draw cut machine saws.)
- Thompson, Henry G. & Son Co., New Haven, Conn.
- West Haven Mfg. Co., 22 Elm St., New Haven, Conn. "Universal" & "Globe."

## HAMMERS, Hand

- Atha Tool Co., Newark, N. J.
- Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Hand.)
- Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
- ★Cheney, H. Hammer Co., Little Falls, N. Y. "Standard."

## Cincinnati Gear Cutters



Equal in Accuracy and Excel in Power and Convenience any other Spur Gear Cutters made.

THE

Cincinnati Gear Cutting Machine Co.

Cincinnati, Ohio

- Drew, C. & Co., Kingston, N. Y.
- Evansville Tool Works, Evansville, Ind. "E. T. W."
- Greene, Tweed & Co., 109 Duane St., N. Y. City. "Colvin."
- Heller Bros. Co., 865 Mt. Prospect Ave., Newark, N. J. "Heller's."
- Humanson & Beckley Mfg. Co., New Britain, Conn. "H. & B."
- Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor." (Chipping hammers.)
- Maydole, The David Hammer Co., Norwich, N. Y. "Maydole."
- Sawyer Tool Mfg. Co., Fitchburg, Mass.
- Smith, H. D. & Co., Plantsville, Conn. "Perfect Handle."
- Warner Hammer Co., Cromwell, Conn. "Warner" & "Noble." (Riveting.)
- Wieland, Chas., 147 & 149 Chambers St., N. Y. City.

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**HAMMERS, Pneumatic**

Chicago Pneumatic Tool Co., Chicago, Ill.  
 Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, O. "Ajax."  
 (For chipping, calking & rivetting.)  
 Dayton Pneumatic Tool Co., Dayton, Ohio.  
 "Dayton."  
 Helwig Mfg. Co., St. Paul, Minn. "Helwig."  
 (For chipping, calking & rivetting.)  
 Ingersoll-Rand Co., 11 Broadway, N. Y. City.  
 "Crown" & "Imperial."  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Standard Railway-Equipment Co., St. Louis, Mo. "Monarch." (Rivetting & chipping.)

**HAMMERS, Steam, Drop & Power**

Alliance Machine Co., Alliance, O. (Steam.)  
 Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. (Drop.)  
 Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y. (Drop.)  
 Bradley, C. C. & Son, 432 N. Franklin St., Syracuse, N. Y. "Bradley." (Power.)  
 Buffalo Foundry & Machine Co., Buffalo, N. Y. (Steam.)  
 Chambersburg Engineering Co., Chambersburg, Pa. (Steam drop.)  
 Consolidated Press & Tool Co., Hastings, Mich. (Drop.)  
 Crane, W. W. Foundry & Machine Works, Auburn, N. Y. "Sheldon." (Helve Trip.)  
 Dienelt & Eisenhardt, 1301-18 N. Howard St., Phila., Pa. (Power.)  
 Erie Foundry Co., Erie, Pa. "Erie." (Steam & drop.)  
 Ferracute Machine Co., Bridgeton, N. J. (Drop presses.)  
 Foglesong Machine Co., The, 127 Ringgold St., Dayton, O. "Dayton." (Power.)  
 Hilbert Machine Co., The, 2116-22 Colerain Ave., Cincinnati, O.  
 Justice, Philip S. & Co., 421 Chestnut St., Phila., Pa. "Justice." (Spring.)  
 Loy & Naurath Co., 21-29 Runyon St., Newark, N. J.  
 McDougall & Potter Co., 606-12 W. 55th St., N. Y. City. (Steam.)  
 Macgowan & Finigan Foundry & Machine Co., St. Louis, Mo. "Perfect."  
 Manning, Maxwell & Moore, Inc., N. Y. City. (Steam.)  
 Mayer Bros., 126 W. Rock St., Mankato, Minn. "New Little Giant." (Power.)  
 Morgan Engineering Co., The, Alliance, Ohio. (Steam drop.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Steam & drop.)  
 Pettingill Machine Co., The, 79 Elm St., Amesbury, Mass. (Power.)  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Drop.)  
 Schulz, Fritz A., 218-30 N. Jefferson St., Chicago, Ill. "Schulz." (Power.)  
 Scranton & Co., The, New Haven, Conn. "Scranton." (Power.)  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Steam.)  
 Stoll, D. H. Co., 36 Lansing St., Buffalo, N. Y. (Drop.)  
 Toledo Machine & Tool Co., The, Toledo, O. (Drop.)  
 Vaughan & Bushnell Mfg. Co., Chicago, Ill. "H. B. Eagle."  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. "Waterbury." (Drop & power.)  
 West Tire Setter Co., 143 Cutler Bldg., Rochester, N. Y. "Rochester." (Helve.)  
 Williams, White & Co., Moline, Ill. (Power & drop.)

**HAND PUNCHES**

(See Punches, Hand.)

**HARDENING COMPOUNDS**

Altamus, W. F., 526 Prospect Ave., Hartford, Conn. "Diamond."

**HARDENING FURNACES**

(See Annealing &amp; Case Hardening Furnaces.)

**HEATERS, Garage**

Baker, The Wm. C. Heating & Supply Co., 143 Liberty St., N. Y. City. "Baker."  
 Cooper Heater Co., Dayton, O. "Cooper."  
 (Hot water.)  
 Garage Heater Co., Syracuse, N. Y. (Hot water.)  
 New York Blower Co., Chicago, Ill.  
 Ruud Mfg. Co., Pittsburg, Pa. "Ruud." (Gas water heater.)

**HOBBING MACHINES**

(See Gear Hobbing Machines.)

**HOISTS**

(See Cranes &amp; Hoists.)

**HORIZONTAL DRILLING MACHINES**

Barnes, W. F. & Jno. Co., 204 Ruby St., Rockford, Ill. "Barnes."  
 Fosdick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, O.  
 McCabe, J. J., 30 Church St., N. Y. City.  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Rockford Drilling Machine Co., Rockford, Ill.  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.

**HYDROMETERS**

★American Thermo-Ware Co., 16 Warren St., N. Y. City. "Autocrat." (Imported.)  
 Globe Optical Co., 403 Washington St., Boston, Mass.  
 Schaeffer & Budenberg Mfg. Co., 963-65 Kent Ave., Brooklyn, N. Y. "S. & B."  
 Scheidig, John & Co., 50 Maiden Lane, N. Y. City.  
 ★Storage Battery Supply Co., The, 239 E. 27th St., N. Y. City.  
 Tagliabue, C. J. Mfg. Co., 53 Fulton St., N. Y. City.  
 Taylor Instrument Companies, Rochester, N. Y. ("Tycos" gasoline & "Pyro" water solution.)  
 Weinhagen, H., 22-24 N. William St., N. Y. City.  
 Witherbee Igniter Co., 1876 Broadway, N. Y. City.

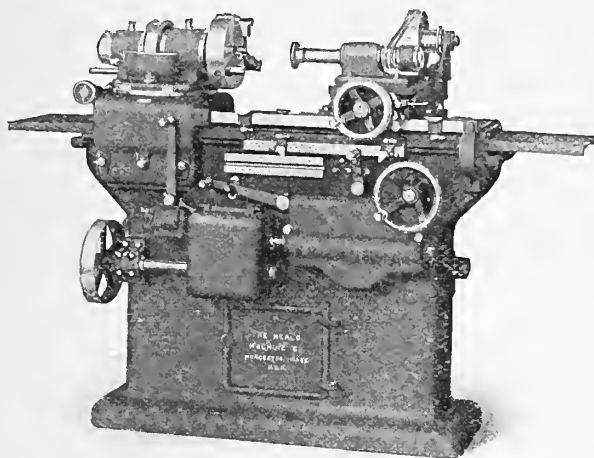
**INTERNAL GRINDERS**

Bath Grinder Co., 67 Walnut St., Fitchburg, Mass. (Duplex.)  
 Bridgeport Safety Emery Wheel Co., Inc., The, Bridgeport, Conn. (Belt & motor driven.)  
 Diamond Machine Co., Providence, R. I. (Cylinder grinders.)  
 ★Heald Machine Co., Worcester, Mass. "Heald."  
 Landis Tool Co., Waynesboro, Pa.  
 Miami Valley Machine Tool Co., Dayton, O. "Dayton."  
 Rivett Lathe Mfg. Co., Brighton, Boston, Mass.  
 U. S. Electrical Tool Co., 1938 W. 8th St., Cincinnati, O.

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# The Heald Internal Grinder



This is a Manufacturing Machine in every sense of the word and marks a great advance in the art of internal grinding. It is massive and rigid; it has five different work speeds and three different rates of table travel for each speed, all instantly available by means of quick change gear boxes. It will halve or quarter the cost of the work done on the ordinary style of internal grinders, as it will cut out stock in place of worrying it out.

This is made possible by the massive design, the heavy work head and more particularly by the construction of the grinding spindle which does not overhang the table, as is usually the case, but is firmly mounted directly on the table, giving it great ability to resist vibration and to cut rapidly, freely and smoothly.

## When You Want a Good Hole

you want to grind it, and a good machine to grind it on.

## The Heald Internal Grinder

is the machine to use, because it is heavy and rigid and built specially for this work, and will do it quicker and better than is possible on the machines generally used. Grinding gives increased accuracy and a beautiful surface and on thin bushings and hardened work is the only practical method of getting good holes. Our catalog is free for the asking.

*Don't forget to ask.*

**The HEALD MACHINE CO.**

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Lecount, Wm. G., South Norwalk, Conn.  
(Cast iron.)

**JAPANNING TANKS**

Baird Machine Co., The, Oakville, Conn.  
Steiner, Emil E., 58 Union St., Newark, N. J.

**JIGS**

- ★American Die & Tool Co., Reading, Pa.
- Elgin Tool Works, The, Elgin, Ill.
- Fortin, The, B. P. Tool Co., 73 Oakland Terrace, Woonsocket, R. I. "Fortin Universal."
- Geier, The P. A. Co., 5112 St. Clair Ave., Cleveland, O.
- Pugh, Owen J., 26 Washington St., Buffalo, N. Y.
- Stein, Wm. P. & Co., 282 State St., Rochester, N. Y. (Drill.)
- Taylor-Shantz Co., 230 Mill St., Rochester, N. Y.

**JIG SAWS**

Thompson, Henry G. & Son Co., New Haven, Conn.

**KETTLES, Potash**

(See Soda & Potash Kettles.)

**KEY SEATING MACHINES**

- Baker Bros., Toledo, O.
- Burr, John T. & Sons, 429-31 Kent Ave., Brooklyn, N. Y. "Burr."
- Davis, W. P. Machine Co., 257 St. Paul St., Rochester, N. Y.
- Garvin Machine Co., Spring & Varrick Sts., N. Y. City.
- McCabe, J. J., 30 Church St., N. Y. City.
- Marshall & Hushart Machinery Co., 11-15 N. Canal St., Chicago, Ill.
- Mitts & Merrill, Saginaw, Mich. "Giant."
- National Machine Tool Co., 212 Lawrence St., Cincinnati, O. "National."
- Niles-Bement-Pond Co., 111 Broadway, N. Y. City.
- Novelty Iron Works, Dubuque, Iowa. "Dubuque."

**KNIVES**

- Atkins, E. C. & Co., Indianapolis, Ind. (Machine.)
- Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Machine.)
- Lancaster Machine & Knife Works, Lancaster, N. Y. "Lancaster." (Machine.)
- Shimer, Samuel J. & Sons, Milton, Pa. (Machine.)
- White, L. & I. J. Co., Buffalo, N. Y. (Auto body.)

**LAMP BRACKETS, Garage**

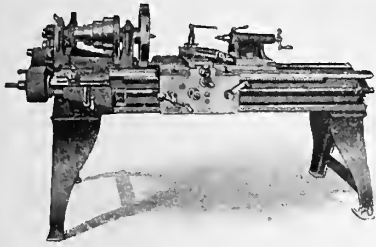
Fiske, J. W. Iron Works, 56-58 Park Place, N. Y. City.

**LAMP GUARDS**

- Crescent Co., Valparaiso, Ind. "Standard," "Crescent," "Standard A," "Loxon" & "Protector X."
- Hubbell, Harvey, Inc., Bridgeport, Conn. "Hubbell."
- ★Morse, Frank W., 516 Atlantic Ave., Boston, Mass. "Never-Break."

**LATHES**

- Alpena Industrial Works, Alpena, Mich. "Kline's."
- American Sawmill Machinery Co., Hackettstown, N. J. "American." (Woodworking.)
- American Tool & Machine Co., 109 Beach St., Boston, Mass. (Turret.)
- ★American Tool Works Co., The, 6th & Eggleston Ave., Cincinnati, O. (Turret & crank turning.)
- American Watch Tool Co., Elm St., Waltham, Mass.
- American Wood Working Machinery Co., Rochester, N. Y.
- Ames, B. C. Co., 21 Crescent St., Waltham, Mass. "Ames."
- Automatic Machine Co., Bridgeport, Conn. (Automatic Screw & worm threading.)
- Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Wood turning.)
- Bardons & Oliver, Cleveland, O. (Turret.)
- ★Barnes Drill Co., Rockford, Ill. (Gap.)
- Barnes, W. F. & John Co., 204 Ruby St., Rockford, Ill. "Barnes." (Foot & power.)
- Bentel & Margendant Co., The, Hamilton, O. "Hamilton." (Wood turning & pattern makers.)
- Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y. (Metal spinning.)
- Blount Co., G. J., Everett, Mass. (Bench & speed.)
- Bradford Machine Tool Co., The, 659-71 Evans St., Cincinnati, O. (Engine & turret.)
- Brown & Sharpe Mfg. Co., Providence, R. I.
- Bullard Machine Tool Co., The, 536 Broad St., Bridgeport, Conn. (Vertical turret.)
- Carroll-Jamieson Machine Tool Co., The, Batavia, Ohio.
- Champion Tool Works, Co., The, Cincinnati, O. "Champion."
- Cincinnati Lathe & Tool Co., 2730-32 Spring Grove Ave., Cincinnati, O. "Cincinnati."
- Cordesman-Rechtin Co., Cincinnati, Ohio. "Cordesman-Rechtin." (Woodworking.)
- Davis Machine Co., W. P., 257 St. Paul St., Rochester, N. Y. (Engine & turret.)
- Defiance Machine Co., Defiance, Ohio. (Wood working lathes.)
- Diamond Machine Co., Providence, R. I. "Diamond."
- Dreses Machine Tool Co., Cincinnati, Ohio. (Brass lathes.)
- Elgin Tool Works, The, Elgin, Ill. (Bench.)
- Espen-Lucas Machine Works, 342 N. 15th St., Phila., Pa. (Crank shaft and crank pin.)
- Fairbanks Co., Springfield, Mass. (Engine.)
- Fay & Scott, Dexter, Me.
- Fitchburg Machine Works, Fitchburg, Mass. "Lo-Swing" & "Fitchburg."
- Fox Machine Co., 327 N. Front St., Grand Rapids, Mich. (Woodworking.)
- Frevert Machinery Co., 18 Dey St., N. Y. City.
- Garvin Machine Co., Spring & Varrick Sts., New York, N. Y.
- Gisholt Machine Co., 1330 Washington Ave., Madison, Wis. "Gisholt." (Turret.)
- Goodell-Pratt Co., Greenfield, Mass.
- Greaves, Klusman & Co., N. E. Cor. Cook & Alfred Sts., Cincinnati, O. (Engine.)
- Hall & Brown Wood-Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo. (Wood turning.)
- Hamilton Machine Tool Co., Hamilton, Ohio. (Engine & turret.)
- Harding Bros., 3133-41 Lincoln Ave., Chicago, Ill. "Cataract." (Bench.)
- Harrington, Edwin Son & Co., 17th & Callowhill Sts., Phila., Pa.
- Hendey Machine Co., Torrington, Conn.
- Hibbard, Wm. H. Mfg. Co., Brooklyn, N. Y. (Spinning.)
- Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
- International Machine Tool Co., W. 21st St. & Belt Ry., Indianapolis, Ind. "Libby." (Turret & heavy duty chucking.)
- Johnson, Israel H., Jr., Co., Inc., Phila., Pa.
- Jones & Lamson Machine Co., Springfield, Vt.



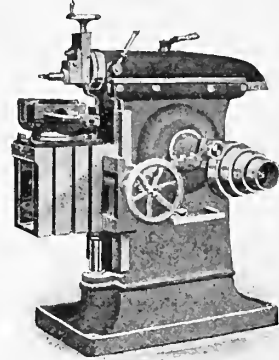
# ATTENTION!

## Manufacturers Garage Owners Machine Shops

We have the largest stock of new and slightly used machinery consisting of all classes of machine tools necessary for the manufacture and repair of the auto.

**Lathes    Milling Machines  
Drills    Grinders  
Shapers    Motors, etc.**

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[PHILADELPHIA, PA.]

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- (Flat turret.)  
 LeBlond, The R. K. Machine Tool Co., 4609 Eastern Ave., Cincinnati, Ohio. (Engine, Turret & speed.)  
 Leiman Bros., 62 John St., N. Y. City.  
 Lodge & Shipley Machine Tool Co., The, Cincinnati, O. (Engine & turret.)  
 McCabe, J. J., 30 Church St., N. Y. City. "McCabe."  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 Manning, Maxwell & Moore, Inc., N. Y. City.  
 Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill. (Engine.)  
 Meriden Machine Tool Co., The, Meriden, Conn. "Yankee," "Meriden" & "Superior."  
 Miami Valley Machine Tool Co., Dayton, O. "Miami Valley."  
 Miller Falls Co., 28 Warren St., N. Y. City. (Small.)  
 Milwaukee Machine Tool Co., 30th & Lloyd Sts., Milwaukee, Wis. (Engine.)  
 Morris, The John B. Foundry Co., Cincinnati, Ohio. "Schellenbach."  
 Motch & Merryweather Machinery Co., The, 707-715 Lakeside Ave., N. W., Cleveland, Ohio.  
 New Haven Mfg. Co., New Haven, Conn.  
 Niles-Bement-Pond Co., 111 Broadway, New York City. (Boring, brass, extension, gap speed lathes & crank pin turning machines.)  
 ★Oliver Machinery Co., Grand Rapids, Mich. (Wood & speed.)  
 Porter, C. O. Machinery Co., Grand Rapids, Mich. (Woodworking.)  
 Power, L. & Co., Phila., Pa. (Woodworking.)  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Turret, standard & bench.)  
 Prentice, Geo. G. & Co., Lenox & Quinriplac Aves., New Haven, Conn. (Multiple spindle turret.)  
 Prentice Bros. Co., Worcester, Mass.  
 Prentiss Tool & Supply Co., 115 Liberty St., New York, N. Y.  
 Prybil, P., 512-24 W. 41st St., N. Y. City. (Metal spinning.)  
 Putman Machine Co., 10-100 Putman St., Fitchburg, Mass.  
 Rahn-Carpenter Co., The, Cincinnati, O. "Rahn-Carpenter." (Engine, turret & gap.)  
 Reed, F. E. Co., 123 Gold St., Worcester, Mass. "Reed." (Engine & hand.)  
 Remington Tool & Machine Co., 50 Congress St., Boston, Mass. (Precision.)  
 Rivett Lathe Mfg. Co., Brighton, Boston, Mass. (Bench.)  
 Robbins Machine Co., Worcester, Mass. (Engine.)  
 Rockford Drilling Machine Co., Rockford, Ill.  
 Rockford Lathe & Drill Co., Rockford, Ill.  
 Schulz, Fritz A., 218-230 N. Jefferson St., Chicago, Ill. "Schulz." (Spinning.)  
 Schumacher & Boye, Queen City Ave. & Buck St., Cincinnati, Ohio. (Turret & screw cutting.)  
 Sebastian Lathe Co., Cincinnati, Ohio. (Engine & foot.)  
 Sellers & Co., Inc., Wm., 1600 Hamilton St., Phila., Pa.  
 Seneca Falls Mfg. Co., 416 Water St., Seneca Falls, N. Y. ("Star," engine & foot power; "Seneca Falls," engine, foot power speed, wood turning & bench.)  
 Shepard Lathe Co., 141 W. 2nd St., Cincinnati, Ohio.  
 Smith, H. B. Machine Co., Smithville, N. J. (Wood.)  
 Smurr & Kamen Machine Co., 313 N. Sacramento Court, Chicago, Ill. (Turret.)  
 Somers, Fitler & Todd Co., 327 Water St., Pittsburg, Pa.  
 South Bend Machine Tool Co., South Bend, Ind. (Bench, foot, engine, hand, screw cutting, small & tool room.)

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**LATHES—Continued**

- Springfield Machine Tool Co., Springfield, O. "Ideal."  
 Stark Tool Co., Waltham, Mass. (Bench.)  
 Steinkle Turret Machine Co., Madison, Wis. (Turret.)  
 Taylor & Fenn Co., Hartford, Conn. (Bench.)  
 Tindel-Morris Co., Eddystone, Pa. (Crank-shaft.)  
 ★Toomey, Frank, 131 N. 3rd St., Phila., Pa. (New & second-hand.)  
 Tucker Machine Co., 224 E. Ninth St., Cincinnati, Ohio. (Grinding.)  
 Turner Machine Co., 2049 N. Second St., Phila., Pa. (Key.)  
 Underwood, H. B. & Co., 1025 Hamilton St., Philada., Pa. (Crank pin turning machines.)  
 Victor Electric Co., 55-61 Market St., Chicago, Ill. "Victor."  
 Von Wyck Machine Tool Co., C. H. & D. R. R. & Elmore St., Cincinnati, Ohio.  
 Walcott & Wood Machine Tool Co., Jackson, Mich. (Including special duplex axle lathes.)  
 Waltham Machine Works, Waltham, Mass. (Bench.)  
 Waltham Watch Tool Co., Springfield, Mass. "Van Norman." (Bench.)  
 Warner & Swasey Co., Cleveland, Ohio.  
 Washburn Shops of the Worcester Polytechnic Institute, The, Worcester, Mass. "Washburn."  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. (For spinning, burnishing, etc.)  
 Welch, Thos. F. Co., 55 Sudbury St., Boston, Mass. (Bench.)  
 Wells, F.E. & Son Co., Greenfield, Mass. (Speed.)  
 Whitcomb-Blaisdell Machine Tool Co., 131 Gold St., Worcester, Mass.  
 White, John A. Co., Dover, N. H.  
 Wood Turret Machine Co., 14 S. Canal St., Chicago, Ill. (Turret & brass.)  
 Wormer, C. C. Machinery Co., Detroit, Mich.

**LATHE CHUCKS**

(See Chucks.)

**LATHE DOGS**

(See Lathe Parts.)

**LATHE PARTS**

- American Tool & Machine Co., 109 Beach St., Boston, Mass. (Slide rests.)  
 American Watch Tool Co., Elm St., Waltham, Mass. (Slide rests.)  
 Armstrong Bros. Tool Co., Chicago, Ill. (Lathe dogs.)  
 Blount, G. J. Co., Everett, Mass. (Slide rests.)  
 Bonney Vise & Tool Works, Allentown, Pa. "Bonney." (Lathe dogs.)  
 Cleveland Wire Spring Co., Cleveland, Ohio. (Pans.)  
 Collmer Bros., 105 Vistula Ave., South Bend, Ind. (Lathe dogs.)  
 Fay & Scott, Dexter, Me. (Turrets.)  
 Fowler Brass Works, Inc., The, 2333-35 Wabash Ave., Chicago, Ill. "Fowler." (Lathe dogs.)  
 Hardinge Bros., 1034-40 Lincoln Ave., Chicago, Ill. (Attachments.)  
 Hill, M. B. Mfg. Co., Worcester, Mass. (Lathe dogs.)  
 Hill Standard Mfg. Co., Anderson, Ind. "Hill." (Lathe dogs.)  
 ★Krieger Tool & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill. "Krieger's." (Double adjustable lathe brackets.)  
 Lancaster Machine & Knife Works, Lancaster, N. Y. "Derrerr." (Lathe attachments for turning odd shapes.)

- Lecount, Wm. G., South Norwalk, Conn. (Steel and malleable iron lathe dogs.)  
 Lodge & Shipley Machine Tool Co., The, Cincinnati, Ohio.  
 Miami Valley Machine Tool Co., Dayton, O. "Miami Valley." (Tail stock turrets.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Attachments.)  
 O. K. Tool Holder Co., Shelton, Conn. "OK." (Lathe dogs.)  
 Ohio Mfg. Co., The, Painesville, Ohio. (Lathe pans.)  
 Phoenix Hardware Mfg. Co., Homer, N. Y. "Phoenix." (Lathe dogs.)  
 Stark Tool Co., Waltham, Mass. (Lathe attachments.)  
 Warner & Swasey Co., Cleveland, Ohio. (Slide rests.)  
 Welch, Thos. F. Co., 55 Sudbury St., Boston, Mass. (Lathe dogs.)  
 Western Tool & Mfg. Co., The, Springfield, Ohio. (Lathe dogs.)  
 Williams, J. H. Co., 150 Hamilton Ave., Brooklyn, N. Y. (Lathe dogs.)

**LATHE TOOLS**

(See Tools, Machinery.)

**LATHE TOOL HOLDERS**

(See Tool Holders.)

**LIFTING JACKS**

(See Jacks.)

**LIGHTING PLANTS**

- Fay & Bowen Engine Co., 76 Lake St., Geneva, N. Y. (Generating sets.)  
 Kaufman, A. J. Mfg. Co., The, Inc., 131-133 Reade St., N. Y. City. "Kaufman" (Kerosene vapor.)  
 Nichols Power Co., Stamford, Conn.  
 Slade Tubing Co., Rome, N. Y. (Hydrocarbon lighting tubes.)  
 Strang Engine Co., Harvey, Ill. "Strang." (Outfits, electric.)

**MACHINERY, Miscellaneous**

- (For particular classes of machinery see under specific headings, such as "Lathes," "Drilling Machines," etc.)  
 Adjustable Collet Co., The, 211 High Ave., Cleveland, Ohio. (Special.)  
 American Blower Co., Detroit, Mich. (Heating & ventilating apparatus, mechanical draft systems.)  
 ★American Die & Tool Co., Reading, Pa. (Special.)  
 American Watch Tool Co., Elm St., Waltham, Mass. (Precision.)  
 American Wood Working Machinery Co., Rochester, N. Y. (Scraping machines.)  
 Ames, B. C. Co., 21 Crescent St., Waltham, Mass. "Ames." (Jig filing machines for die work and small special machines to order.)  
 Automatic Machine Co., Bridgeport, Conn. (Special wire forming & wire crimping machinery; special machinery to order.)  
 Badger State Machine Co., Janesville, Wis. (Bending rolls.)  
 Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich. (Special.)  
 Baird Machine Co., The, Oakville, Conn. "Baird." (Spring coiling machines, hinge machines, wire and sheet metal machines.)  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Saw and knife fitting machinery, filers, setters & retouchers & bolting mills.)

**MACHINERY, Miscellaneous—Continued**

- Beaman & Smith Co., The, Gordon & Reynolds Ave., Providence, R. I. (Special machines.)
- Binsse Machine Co., The, Newark, N. J. (Machine tools.)
- Black Diamond Saw & Machine Works, Natick, Mass. ("Only" combined band filing and setting machines; "Black Diamond" circular saw filing machines.)
- Blair Tool & Machine Works, 24-27 West St., N. Y. City. (Special.)
- Blake & Johnson Co., Thomaston Ave., Waterbury, Conn. (Rivet machines, thread rolling machines, etc.)
- Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y. (Bending machines & double seaming machines.)
- Boucher, The H. E. Mfg. Co., 91 Maiden Lane, N. Y. City. (Special.)
- Bridgewater Machine Co., The, 31-35 Cherry St., Akron, O. (Machinery for making auto tires, bumpers, etc.)
- Buffalo Forge Co., Buffalo, N. Y. "Buffalo." (Pipe bending machines, heating & venting apparatus & mechanical drain apparatus.)
- Buffalo Foundry & Machine Co., Buffalo, N. Y. (Special, to order.)
- Buob & Scheu, 1408-10 Gilbert Ave., Cincinnati, O. (Top auto bow dresser.)
- Burt Mfg. Co., Clinton & Fulford Sts., Kalamazoo, Mich. "Schau." (Tire setting machines.)
- Cady Machine Co., The, 968 E. 69th Place, Cleveland, Ohio. (Tire chain machines & wire forming machines.)
- Carter & Hakes Machine Co., The, Winsted, Conn. (Special.)
- Chambersburg Engineering Co., Chambersburg, Pa. (Hydraulic forging, bending & rivetting machines.)
- Chicago Pneumatic Tool Co., Chicago, Ill. (Pipe bending machines.)
- Cincinnati Lathe & Tool Co., 2730-32 Spring Grove Ave., Cincinnati, Ohio. (Machine tools.)
- Cincinnati Punch & Shear Co., Cincinnati, O. (Bending & straightening rolls.)
- Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Varnish rubbing machines.)
- Cochrane-Bly Co., Rochester, N. Y. (Saw sharpening machines; filing machines.)
- Consolidated Press & Tool Co., Hastings, Mich. (Sheet metal working machinery.)
- Cook, Asa S. Co., 80 Huyshope Ave., Hartford, Conn. (Special.)
- Coulter & McKenzie Machine Co., Bridgeport, Conn. (Spring testing machines & spring making machinery.)
- ★Defiance Machine Works, Defiance, Ohio. (Fly wheel balancing machines.)
- Detroit Metal Parts Co., Detroit Mich. (Special.)
- ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. (Automatic.)
- Dwight Slate Machine Co., Hartford, Conn. (Marking machines, hand & power.)
- Edge, Frank & Co., 31 & 33 S. Front St., Grand Rapids, Mich. (Filing, setting & brazing machines.)
- Elgin Tool Works, The, Elgin, Ill. (Special, to order.)
- Elmes, Chas. F. Engineering Works, Cor. Morgan & Fulton Sts., Chicago, Ill. (Special.)
- Espen-Lucas Machine Works, 342 N. 5th St., Phila., Pa. (Saw grinding machines, & axle finishing machines.)
- Ferracute Machine Co., Bridgeton, N. J. (Sheet metal working machinery.)
- Fort Dearborn Mfg. Co., 1574-80 Crossing St., Chicago, Ill. (Special.)
- Garvin Machine Co., Spring & Varrick Sts., N. Y. City. (Spring coilers.)
- Geier, The P. A. Co., 5112 St. Clair Ave., Cleveland, Ohio.
- Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. (Special.)
- Gorton, George, Machine Co., Racine, Wis. "Gorton." (Engraving machines for hub caps, label plates, etc.)
- Grant Mfg. & Machine Co., The, 90 Silliman Ave., Bridgeport, Conn. ("Grant" rivet spinning machines; "K-B" die filing machines.)
- Greaves, Klusman & Co., N. E. Cor. Cook & Alfred Sts., Cincinnati, Ohio. (Machine tools.)
- Heartley Machine Variety Iron & Tool Works, 900-908 Summit St., Toledo, O. (Metal wheel making & special machinery.)
- Hill, Clark & Co., 156 Oliver St., Boston, Mass. (Machine tools.)
- Hoysradt & Case, Kingston, N. Y. (Special machinery of medium weight on contract.)
- Ingle Machine Co., 299-309 St. Paul St., Rochester, N. Y. (Automatic & special machinery.)
- Kane & Roach, Syracuse, N. Y. (Crank forging machines.)
- Kemp, J. P., 1618 Ruskin Ave., Baltimore, Md. (Machine tools.)
- Kempsmith Mfg. Co., Milwaukee, Wis. "Kempsmith."
- Knight, W. B. Machinery Co., 2019 Lucas Ave., St. Louis, Mo. (Special.)
- Lodge & Shipley Machine Tool Co., The, Cincinnati, Ohio. (Machine tools.)
- Long & Allstatter Co., Hamilton, Ohio. (I beam coping machines & armature disc notching machines.)
- McCabe Machine Co., 95 Liberty St., N. Y. City.
- Manning, Maxwell & Moore, Inc., N. Y. City. (Machine tools.)
- Manville, E. J. Machine Co., Waterbury, Conn. (Rivet machines, thread rollers & special machinery.)
- Marbach, The, F. G. Co., Medina, O. (Special.)
- Massnick-Phipps Mfg. Co., 1091 Champlain St., Detroit, Mich. (Special.)
- Mitts & Merrill, Saginaw, Mich. (Band saw scarfers.)
- National Machinery Co., Tiffin, Ohio. (Screw gimlet pointers, rivet headers and roll thread machines.)
- National Stamping & Electric Works, 153-59 S. Jefferson St., Chicago, Ill.
- New Doty Mfg. Co., Janesville, Wis. (Bending & straightening rolls.)
- Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa. (Saw sharpening machines.)
- ★Niagara Machinery Co., 825-27 Linwood Ave., Niagara Falls, N. Y. (Special, to order.)
- Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Straightening machinery; machine tools.)
- Nilson, The A. H. Machine Co., Bridgeport, Conn. (Automatic wire straightening & forming machines; also special machines, to order.)
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. (To order.)
- Nutter & Barnes Co., 326 A St., Boston, Mass. (Automatic saw sharpeners.)
- Peck, Stow & Wilcox Co., Southington, Conn. (Crimping & beading machines.)
- Perkins Machine Co., Warren, Mass. (Bending & straightening rolls.)
- Pettingill Machine Co., 79 Elm St., Amesbury, Mass. (Moulding or beading former & metal cutting machine.)
- Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.
- Potter & Johnston Machine Co., Pawtucket, R. I. (Automatic turning machines.)
- ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Shaving machines.)
- Pugh, Owen J., 26 Washington St., Buffalo, N. Y. (Special.)
- Queen City Punch & Shear Co., 208-12 Lawrence St., Cincinnati, Ohio. (Bending & straightening rolls, hand, foot & motor driven.)
- Racine Steel Castings Co., Racine, Wis.
- Reynolds Machine Co., Moline, Ill. "Reynolds." (Screw driving machines.)

★ indicates Advertisers—see Index in back of book.

**MACHINERY, Miscellaneous—Continued**

Robinson, The J. M. Mfg. Co., Cincinnati, Ohio. (Bending machines.)  
 Robinson Tool Works, Waterbury, Conn. "Hartford." (Filing machines.)  
 Rowbottom Machine Co., The, Waterbury, Conn. (Special auto.)  
 S. P. O. Automobile Co., 1595 Broadway, N. Y. City. "S. P. O." (Imported.)  
 Schaal, W. R. Tool & Machine Works, Grand Central Market Bldg., Harrison & Loomis Sts., Chicago, Ill. (Special.)  
 Sebastian Lathe Co., Cincinnati, Ohio. (Machine tools.)  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Testing machines.)  
 Shulz, Fritz A., 218-30 N. Jefferson St., Chicago, Ill.  
 Sinclair-Scott Co., Wells & Patapsco Sts., Baltimore, Md.  
 Smith, E. G. & Co., Columbia, Pa. (Filing machines.)  
 Smurr & Kamen Machine Co., 313 N. Sacramento Court, Chicago, Ill. (Machine tools & special machinery.)  
 Springfield Machine Tool Co., Springfield, Ohio. (Special.)  
 Standard Engineering Works, Ellwood City, Pa. (Special.)  
 Stein, Wm. P. & Co., 232 State St., Rochester, N. Y. (Special.)  
 Stimpson Co., Edwin B., 31 Spruce St., N. Y. City. (Eyeletting, grommet & riveting machines & headers & skiving machines.)  
 Stoever Foundry & Mfg. Co., 140 Cedar St., N. Y. City. (Pipe bending machines.)  
 Stoll, D. H. Co., 36 Lansing St., Buffalo, N. Y. (Pipe bending machines.)  
 Swaine, The Fred J. Mfg. Co., St. Louis, Mo. (Sheet metal machinery.)  
 Taylor & Fenn Co., Hartford, Conn. (Special.)  
 Taylor-Shantz Co., 230 Mill St., Rochester, N. Y. (Special.)  
 Torrington Mfg. Co. The, Torrington, Conn. (Special.)  
 Tschudi-McBarron Machine Co., The, Armory Bldg., Dayton, Ohio. "Diamond." (Oval & circle cutting machines.)  
 Tucker Machine Co., 224 E. Ninth St., Cincinnati, Ohio. (Emery & sand belt machines.)  
 Turner Machine Co., Danbury, Conn. (Special.)  
 Underwood, H. B. & Co., 1025 Hamilton St., Phila., Pa. (Portable pipe bending machines.)  
 Victor Iron Works, 523 Schofield Bldg., Cleveland, Ohio. (To order.)  
 Wade Machine Co., 287 Atlantic Ave., Boston, Mass. (To order.)  
 Wainwright, W. W. & Son, 16th St. & Western Ave., Connerville, Ind. (To order.)  
 Walker, O. S. & Co., 25 Union St., Worcester, Mass. "Globe." (Tool sharpeners.)  
 Wallace Supply Co., 19 South Jefferson St., Chicago, Ill. (Angle benders, eye benders, hand power.)  
 Waterbury Machine Co., Waterbury, Conn. (Eyelet machines & gang slitters.)  
 Watson-Stillman Co., Hudson Terminal Bldgs., N. Y. City. (Shaft straighteners.)  
 Webster & Perks Tool Co., Springfield, Ohio. (Special, to order.)  
 Wells, Frank L. Co., Kenosha, Wis. "Hoefler." (Spring coiling & knotting machines.)  
 West Tire Setter Co., 143 Cutler Bldg., Rochester, N. Y. "West." (Hydraulic tire setter.)  
 White, John A. Co., Dover, N. H. (Band saw filing machines.)  
 Whiting, Geo. Co., 1417 W. North Ave., Chicago, Ill. (Bending & straightening rolls.)  
 Williams Foundry & Machine Co., Akron, Ohio. (Rubber machinery.)  
 Wilson, W. A. Machine Co., Rochester, N. Y.  
 Wood Turret Machine Co., 14 S. Canal St., Chicago, Ill. (Iron & brass working machinery.)

**MACHINERY AND TOOL JOBBERS AND DEALERS**

Bittenbender Co., The, Scranton, Pa. (Blowers, leather, canvas & rubber belting.)  
 Broadway Bicycle & Auto Supply Co., 60 Vesey St., N. Y. City. (Tools.)  
 Brunner, H. J. Hardware Co., Kansas City, Mo. (Machinery.)  
 Carpenter-Kerlin Gear & Machine Co., 77 White St., N. Y. City.  
 Channon, H. Co., Market & Randolph Sts., Chicago, Ill.  
 Chicago Wheel & Mfg. Co., 1101-1103 W. Monroe St., Chicago, Ill. (Grinders, speed indicators, emery & sand paper, etc.)  
 Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, O. "Lightning." (Hose clamp tools.)  
 Coggins & Owens, Baltimore, Md. (Machinery & tools.)  
 Diamond Machine Co., Providence, R. I. (Emery wheels.)  
 Frevort Machinery Co., 18 Dey St., N. Y. City.  
 Manning, Maxwell & Moore, Inc., N. Y. City.  
 McCabe, J. J., 30 Church St., N. Y. City.  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 Patterson, Gottfried & Hunter, Ltd., 146-150 Centre St., N. Y. City. (Tools.)  
 Rogers, H. A. Co., 19 John St., N. Y. City. (Morse twist drills, belting, blocks, bolts, files, forges, hammers, lubricators, packing, screws, taps, valves, vises, waste, wrenches, stocks & dies, pipe & pipe fittings.)  
 ★Toomey, Frank, 131 N. 3rd St., Phila., Pa.  
 Welland, Chas., 147-149 Chambers St., N. Y. City. (Tools.)  
 Wormer, C. C. Machinery Co., Detroit, Mich.  
 York Band Saw Works, 242 S. Penn St., York, Pa. (Circular saws & mill supplies.)

**MACHINERY PARTS**

Adams Co., The, Dubuque, Iowa. ("Adams" grinding stands; "Farwell" milling attachments for planers.)  
 American Specialty Co., 834-5 Monadnock Bldg., Chicago, Ill. "Use-Em-Up." (Sockets & sleeves.)  
 Armstrong Bros. Tool Co., Chicago, Ill. (Planer jacks.)  
 Armstrong Mfg. Co., 295 Knowlton St., Bridgeport, Conn. "Armstrong." (Nipple holders.)  
 Baker Bros., Toledo, Ohio. (Tapping machine attachments.)  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Bullard Machine Tool Co., 536 Broad St., Bridgeport, Conn. (Boring mill accessories.)  
 Carter & Hakes Machine Co., The, Winsted, Conn. (Screw & lever vises for milling machines.)  
 Celfor Tool Co., Chicago, Ill. "Rich." (Sockets & sleeves.)  
 Cincinnati Milling Machine Co., The, Cincinnati, Ohio. (Milling attachments.)  
 Cincinnati Planer Co., Cincinnati, Ohio. (Planer centers.)  
 Curtis & Curtis Co., Bridgeport, Conn. "Curtis." (Nipple holders.)  
 Diamond Machine Co., Providence, R. I. "American." (Grinding attachments.)  
 Dorman, John H., 1 Bethune St., N. Y. City. "Dorman." (Tapping attachments.)  
 Errington, E. A., 39 Cortlandt St., N. Y. City. "Errington." (Stud or nut setters.)  
 Fay & Scott, Dexter, Me. (Planer & shaper centers.)

**MACHINERY PARTS—Continued**

- Fox Machine Co., 127 N. Front St., Grand Rapids, Mich. (Milling machine vises.)  
 Gardner Machine Co., Beloit, Wis. (Disc grinder supplies & abrasive discs.)  
 Graham Mfg. Co., Providence, R. I. (Drill speeders & vises.)  
 Hendey Machine Co., Torrington, Conn. (Planer & shaper vises.)  
 Hill, M. B. Mfg. Co., Worcester, Mass. "Hill." (Milling machine dogs, hold back & face-plate dogs, universal grinder dogs & handy holders.)  
 ★Hinckley Machine Works, The, Hinckley, Ill. "Davis." (Milling attachment & compound table for drill press.)  
 Hopkinson Machine Works, 23 Taylor St., Springfield, Mass. "Hopkinson." (Drill vises.)  
 Kempsmith Mfg. Co., Milwaukee, Wis. "Kempsmith." (Milling machine attachments.)  
 Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y. "Keystone." (Drilling post.)  
 Lang, G. R. Co., Meadville, Pa. "Lang's." (Planer clamps, bolt heads for planers.)  
 Mark Motor Co., 8721 Harkness Rd., Cleveland, O. (Milling machine attachments for drill presses.)  
 Massey Vise Co., 9-11 W. Michigan St., Chicago, Ill. "Lightning." (Drill press, milling machine & planer vises.)  
 Modern Tool Co., Erie, Pa. "Star" & "Modern." (Tapping attachments.)  
 Morse Twist Drill & Machine Co., New Bedford, Mass. (Sockets & sleeves.)  
 Nicholls, William S., 253 Broadway, N. Y. City. "T. S." (Drill press vises.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Milling & tapping machine attachments.)  
 O. K. Tool Holder Co., Shelton, Conn. "O K." (Tool posts & lifting board for drop hammers.)  
 Plunket, J. E., 1342 W. Lake St., Chicago, Ill. "Plunket." (Machine tool vises.)  
 Pugh, Owen J., 26 Washington St., Buffalo, N. Y. (Milling fixtures.)  
 Queen City Machine Tool Co., N. W. Cor. Sycamore & Webster Sts., Cincinnati, Ohio. (Planer & shaper vises & shaper accessories.)  
 Remington Tool & Machine Co., 50 Congress St., Boston, Mass. (Self fitting shaft key.)  
 Richards, I. P. Co., 23 Pemberton St., Providence, R. I. (Couplings.)  
 Schuchardt & Schutte, 90 West St., N. Y. City.  
 Skinner Chuck Co., New Britain, Conn. (Drill press vises & face plate jaws.)  
 Standard Gauge Steel Co., Beaver Falls, Pa. (Finished machine keys, finished machine tacks & adjusting worm screws.)  
 Standard Tool Co., Cleveland, O. (Sockets.)  
 Stein, Wm. P. & Co., 282 State St., Rochester, N. Y. (Milling fixtures.)  
 Steptoe, The John Shaper Co., 2951-61 Colerain Ave., Cincinnati, Ohio. "Steptoe." (Shaper, milling machine, drill & planer vises.)  
 Taft-Peirce Manufacturing Co., Woonsocket, R. I.  
 Titus Machine Works, Marion, Ohio. (Drill press vises.)  
 Underwood, H. B. & Co., 1025 Hamilton St., Phila., Pa. (Radius planer attachment.)  
 Union Twist Drill Co., Athol, Mass. (Sockets & sleeves.)  
 White, John A. Co., Dover, N. H. (Band saw guides & buzz planer guards.)  
 ★Whitney Mfg. Co., The, Hartford, Conn. "Whitney." (Keys & cutters for the Woodruff Patent keying system.)  
 Williamson Vise Co., Bradford, Pa. (Pipe, planer & shaper vises.)

**MACHINISTS' HAMMERS**

(See Hammers, Hand.)

**MANDRELS**

(See Arbors or Mandrels.)

**MEASURES**

- Central Stamping Co., 172-74 Fulton St., N. Y. City.  
 ★Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.  
 Hill Dryer Co., 344 Park Ave., Worcester, Mass.  
 Knapp Mfg. Co., N. Y. City.  
 Sexton Can Co., 2 Hartford St., Boston, Mass. "Sexton."  
 Wilson, F. Cortez & Co., 239-241 Lake St., Chicago, Ill. "Truo." (Oil measures.)

**MERCURY RECTIFIERS**

(See Current Rectifiers.)

**METAL MELTING FURNACES**

- Barnett, Oscar Foundry Co., Newark, N. J. (Brass & copper.)  
 Brass Founders' Supply Co., Newark, N. J. (Brass & copper.)  
 Detroit Foundry Supply Co., Detroit, Mich. (Brass.)  
 Frictionless Metal Co., Chattanooga, Tenn. "Buck's."  
 Hawley Down Draft Furnace Co., The, First National Bank Building, Chicago, Ill. "Schwartz."  
 Hoskins Mfg. Co., Detroit, Mich. "Hoskins." (Electric.)  
 International Sales Co., 515 Equitable Bldg., Baltimore, Md. (Babbitt.)  
 Kroeschell Bros. Co., 444 W. Erie St., Chicago, Ill. "Kroeschell-Schwartz." (Brass & copper.)  
 Leiman Bros., 62 John St., N. Y. City.  
 Monarch Engineering & Mfg. Co., The, 1200-1206 American Bldg., Baltimore, Md. "Steele-Harvey" & "Monarch."  
 Obermayer, S. Co., Cincinnati, O.  
 Rockwell, W. S. Co., 50 Church St., N. Y. City.  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.  
 Tate, Jones & Co., Inc., 806 Empire Bldg., Pittsburg, Pa.  
 U. S. Gas Furnace Co., 143 Eddy St., Providence, R. I.  
 Westmacott Gas Furnace Co., 68 Clifford St., Providence, R. I. "Westmacott." (Gas blast & fuel oil.)  
 Wise, J. B., Watertown, N. Y. "M. R. V." (Brass & copper.)

**MICROMETERS**

- Davis Mfg. Co., 15th St. & Park Ave., Milwaukee, Wis. "Davis." (Tubular.)  
 Goodell-Pratt Co., Greenfield, Mass.  
 Sawyer Tool Mfg. Co., Fitchburg, Mass.  
 Schellenberg-Hunt Tool Co., Cincinnati, Ohio.  
 Slocumb, J. T. Co., 29 Oxford St., Providence, R. I. "Slocumb."  
 Starrett, L. S. Co., Athol, Mass.

**MILLING CUTTERS**

- Barber-Colman Co., Rockford, Ill.  
 Becker Milling Machine Co., Hyde Park, Mass.  
 Boker, Herman, 101 Duane St., N. Y. City.  
 Clough, R. M., Tolland, Conn.  
 Ingersoll Milling Machine Co., Rockford, Ill.

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**MILLING CUTTERS—Continued**

- Kearney & Trecker, Milwaukee, Wis. "Milwaukee."  
 Morse Twist Drill & Machine Co., New Bedford, Mass.  
 National Tool Co., Cleveland, Ohio.  
 National Twist Drill & Tool Co., Detroit, Mich.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Standard Tool Co., Cleveland, O.  
 Union Twist Drill Co., Athol, Mass.  
 Universal Boring Machine Co., Hudson, Mass.  
 ★Ward, Edgar T. & Sons, 23-25 Purchase St., Boston, Mass.

**MILLING MACHINES**

- Adams Co., The, Dubuque, Iowa. "Farwell."  
 American Tool & Machine Co., 109 Beach St., Boston, Mass. (Valve.)  
 Ames, B. C. Co., 21 Crescent St., Waltham, Mass. "Ames." (Bench.)  
 Beaman & Smith Co., The, Gordon & Reynolds Aves., Providence, R. I.  
 Becker Milling Machine Co., Hyde Park, Mass. (Plain, horizontal & vertical.)  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Carter & Hakes Machine Co., The, Winsted, Conn. "Lincoln." (Bench.)  
 Chicago Machine Tool Co., Chicago, Ill. (Bench & hand.)  
 Cincinnati Milling Machine Co., The, Cincinnati, Ohio. (Vertical, plain & universal.)  
 Clough, R. M., Tolland, Conn. (Vertical, with slotting attachment.)  
 Cook, Asa S. Co., 80 Huyshope Ave., Hartford, Conn. "Colt" & "Cook."  
 Espen-Lucas Machine Works, 342 N. 15th St., Phila., Pa.  
 Fostick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, Ohio. (Horizontal.)  
 Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
 Frevert Machinery Co., 18 Dey St., N. Y. City.  
 Garvin Machine Co., Spring & Varrick Sts., N. Y. City. (Plain, universal & vertical.)  
 Hendey Machine Co., Torrington, Conn.  
 Hill, Clark & Co., 156 Oliver St., Boston, Mass.  
 Ingersoll Milling Machine Co., Rockford, Ill. "Ingersoll."  
 Kearney & Trecker, Milwaukee, Wis. "Milwaukee."  
 Kempsmith Mfg. Co., Milwaukee, Wis. "Kempsmith." (Plain & universal.)  
 Knight, W. B., Machinery Co., 2019 Lucas Ave., St. Louis, Mo. "Knight."  
 Le Blond, R. K. Machine Tool Co., The, 4609 Eastern Ave., Cincinnati, Ohio. (Plain & universal.)  
 Lucas Machine Tool Co., Cleveland, Ohio. "Precision." (Horizontal, boring, drilling & milling machine.)  
 McCabe, J. J., 30 Church St., N. Y. City. (Plain, universal & vertical.)  
 Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
 Mitts & Merrill, Saginaw, Mich. "Giant." (Keyseat.)  
 Motch & Merryweather Machinery Co., The, 707-15 Lakeside Ave., N. W., Cleveland, O.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa. (Horizontal, plain, universal & vertical.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City. (Bench, horizontal, plain, universal & vertical.)  
 Oesterlein Machine Co., The Cincinnati, Ohio. "Oesterlein." (Horizontal, plain & universal.)  
 Owen Machine Tool Co., The, Springfield, O.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Thread.)  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Rivett Lathe Mfg. Co., Brighton, Boston, Mass.

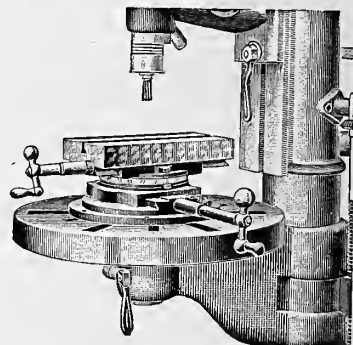
- Schuchardt & Schutte, 90 West St., N. Y. City. (Cam.)  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Horizontal & vertical.)  
 South Bend Machine Tool Co., South Bend, Ind.  
 Stark Tool Co., Waltham, Mass. (Bench.)  
 Underwood, H. B. & Co., 1025 Hamilton St., Phila., Pa. (Portable.)  
 Universal Boring Machine Co., Hudson, Mass.  
 Waltham Watch Tool Co., Springfield, Mass. "Van Norman."  
 Warner & Swasey Co., Cleveland, Ohio.  
 Whitney Mfg. Co., Hartford, Conn. "Whitney." (Hand feed.)  
 Wormer, C. C. Machinery Co., Detroit, Mich. (Plain.)

**MONKEY WRENCHES**

(See wrenches.)

**MORTISING MACHINES**

- American Wood Working Machinery Co., Rochester, N. Y.  
 Bentel & Margendant Co., The, Hamilton, O. "Hamilton."  
 Black Bros. Machinery Co., Mendota, Ill.  
 Cordesman-Rechtin Co., Cincinnati, Ohio. "Cordesman-Rechtin."  
 Hall & Brown Wood Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo.  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Smith, H. B. Machine Co., Smithville, N. J.  
 Yerkes & Finan Wood Working Machine Co., St. Louis, Mo.

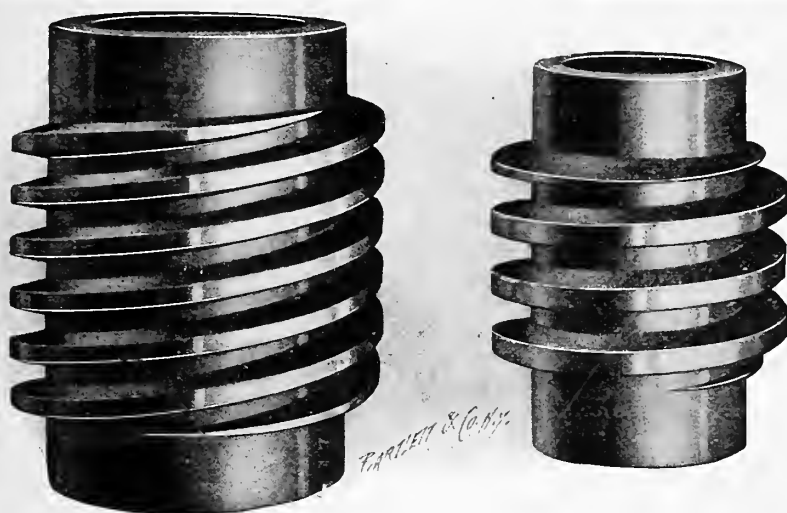


**The "Davis" Milling Attachment and Compound Table** for the drill press for garage, repair and machine shops. : : :  
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WORKS ten times faster than any lathe or special thread-cutting machine, even when equipped with the most special appliances. No other machine can equal it in latitude of work, accuracy, finish or output. Takes the full depth of cut and finishing cut at the same time. Requires no great mechanical skill to operate it. Simpler than thread cutting on a lathe. A boy can produce accurate work.

Operation is automatic, permitting one man to operate from two to six machines. Write for catalog, "Thread Millers"

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CLEVELAND—Rockefeller Building  
ST. LOUIS—516 N. 3d Street  
LONDON—23 Victoria St., S. W.

## MOULDS & CORES

Bridgewater Machine Co., The, 31-35 Cherry St., Akron, O.

## MOULDING MACHINES, Metal

Adams Co., The, Dubuque, Ia. "Farwell."  
Arcade Mfg. Co., Freeport, Ill.  
Bridgeport Foundry & Machine Co., Bridgeport, Conn. "Bridgeport."  
Power, L. & Co., Phila., Pa.  
Tabor Mfg. Co., 18th & Hamilton Sts., Phila., Pa. "Tabor."  
Turner Machine Co., 2049 N. Second St., Phila., Pa.

## MOULDING MACHINES, Wood

American Wood Working Machinery Co., Rochester, N. Y.  
Bentel & Margendant Co., The, Hamilton, O. "Hamilton."  
Cordesman-Rechtin Co., Cincinnati, Ohio. "Cordesman-Rechtin."  
Hall & Brown Wood Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo.  
Ross, Josiah Mfg. Co., 1443-59 Niagara St., Buffalo, N. Y.  
Shimer, Samuel J. & Sons, Milton, Pa. "Shimer."  
Smith, H. B. Machine Co., Smithville, N. J.  
White, John A. Co., Dover, N. H.  
Yerkes & Finan Wood Working Machine Co., St. Louis, Mo.

## MULTIPLE SPINDLE DRILLS

Barnes, W. F. & Jno. Co., 204 Ruby St., Rockford, Ill. "Barnes."  
★Barnes Drill Co., Rockford, Ill.  
Cincinnati-Bickford Tool Co., The, Spring Grove Ave. & Township St., Cincinnati, Ohio.  
Clark, James, Jr., Electric Co., 520 W. Main St., Louisville, Ky.  
Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
Gardam, Wm. & Sons Co., N. Y. City.  
Harrington, Edwin Son & Co., 17th & Callowhill Sts., Phila., Pa.  
Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
Mechanics Machine Co., Rockford, Ill. "Mechanics."  
National Automatic Tool Co., Dayton, Ohio.  
National Equipment Co., Springfield, Mass.  
Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa.  
Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
Prentice Bros. Co., Worcester, Mass.  
Rockford Drilling Machine Co., Rockford, Ill.  
Taylor & Fenn Co., Hartford, Conn.

## OIL CANS

(See Oilers, Squirt.)

## OIL FILTERS

National Separator & Machine Co., Boston, Mass. "National." (For turret lathe chips.)  
Pittsburg Gage & Supply Co., 30th & Liberty Sts., Pittsburg, Pa.

## OIL PUMPS, Garage

(See Gasoline & Oil Pumps.)

## OIL SEPARATORS

National Separator & Machine Co., Boston, Mass. "National" & "Springfield." (For turret lathe chips.)  
American Tool & Machine Co., 109 Beach St., Boston, Mass.

## OIL STONES

American Emery Wheel Works, Providence, R. I. "American."  
Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill. "Gem," "Ruby," "Caedo" & "Keene-Edge."  
Norton Grinding Co., Barbers Crossing, Worcester, Mass. "India."  
Pike Mfg. Co., Pike, N. H. "Arkansas" "Washita," "Queer Creek" & "Hindustan."  
Tanite Co., The, Stroudsburg, Pa. "Tanite."  
Vitrified Wheel Co., Westfield, Mass. "Vitrified."

## OIL & GREASE STORAGE OUTFITS

★Hunt Mfg. Co., Ottumwa, Iowa.

## OVENS

American Enamel Co. Providence, R. I. "Mas-cot." (Enameling.)  
Byram & Co., Inc., Detroit, Mich. (Core baking.)  
Central Iron Works, 200-209 S. Front St., Quincy, Ill. (Core baking.)  
Cullen-Atkinson Co., Hartford, Conn. (Core baking & enameling.)  
Millett Core Oven Co., Springfield, Ohio. (Core baking.)  
Monarch Engineering & Mfg. Co., The, 1200-1206 American Bldg., Baltimore, Md. "Monarch." (Core.)  
Oven Equipment & Mfg. Co., Stamford, Conn. (Core baking, enameling, japanning & bluing.)  
Rockwell, W. S. Co., 50 Church St., N. Y. City. (Core.)  
Steiner, Emil E., 58 Union St., Newark, N. J. (Enameling ovens.)  
Stevens, Frederick B., Detroit, Mich. (Core baking.)

## OXYGEN GAS GENERATORS

Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.

## PANELS, Charging

(See Charging Apparatus.)

## PATTERN SHOP MACHINERY

Baker Bros., Toledo, O.  
Blount, G. J. Co., Everett, Mass.  
★Defiance Machine Works, The, Defiance, O.  
Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.

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Ayes & Co., 1812-16 Ellen St., Chicago, Ill. "Barnes" & "Saunders."  
Barnes Tool Co., The, New Haven, Conn. "Genuine Barnes."  
Bonney Vise & Tool Co., Allentown, Pa. "Bonney." (Combination wrench & pipe cutter.)  
Collmer Bros., 105 Vistula Ave., South Bend, Ind. "Barnes."  
Curtis & Curtis Co., Bridgeport, Conn.  
Erie Tool Works, Erie, Pa.  
Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
Hollands Mfg. Co., Erie, Pa. "Keystone."  
Lord, L. L. Co., Meadville, Pa. "Lord."  
Reed Mfg. Co., Erie, Pa.  
Toledo Pipe Threading Machine Co., Toledo, Ohio. "Toledo."  
Wells, F. E. & Son Co., Greenfield, Mass. "Wells."

### PIPE CUTTING AND THREADING MACHINERY

Bignall & Keeler Mfg. Co., Edwardsville, Ill. "Peerless," "P. D. Q. C.," "Duplex," "B. & K."  
Curtis & Curtis Co., Bridgeport, Conn.  
Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
Loew Mfg. Co., The, Cleveland, Ohio. "Loew Victor."  
McCabe, J. J., 30 Church St., N. Y. City.  
Merrell Mfg. Co., The, Toledo, O. "Merrell" & "Apex."  
Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
Standard Engineering Works, Elwood City, Pa.  
Stoever Foundry & Mfg. Co., 140 Cedar St., N. Y. City.  
Wiley & Russell Mfg. Co., Greenfield, Mass. "Lightning" & "Green River."  
Williams Tool Co., Erie, Pa. "Williams." (Hand & power.)

### PISTON RING EXPANDERS

Economic Tool Co., Lorain, O. "Economic."

### PISTON RING GRINDERS

Harding, S. B., Waukesha, Wis. "Alert."  
★Heald Machine Co., Worcester, Mass. "Heald."

### PISTON RING MACHINES

Windsor Machine Co., Windsor, Vt.

### PLAIN GRINDERS

Bath Grinder Co., 67 Walnut St., Fitchburg, Mass.  
Bridgeport Safety Emery Wheel Co., The, Inc., Bridgeport, Conn. (Belt & motor driven.)  
Landis Tool Co., Waynesboro, Pa.

### PLANES, Woodworking

Chapin-Stevens Co., Pine Meadow, Conn.  
Gage Tool Co., Vineland, N. J.  
Mack & Co., Rochester, N. Y. "D. R. Barton."  
Ohio Tool Co., Columbus, O.  
Sandusky Tool Co., Sandusky, O.

### PLANERS, Metal

★American Tool Works Co., The, 6th & Eggleston Ave., Cincinnati, O.  
Bartlett, Edwin E., 326 A St., Boston, Mass.  
Betts Machine Co., Wilmington, Del.  
Chandler Planer Co., Ayer, Mass.  
Cincinnati Planer Co., Cincinnati, O. (Iron.)  
Cincinnati Shaper Co., The, Elam St. & Garard Ave., Cincinnati, O. (Crank.)  
Cleveland Planer Works, Cleveland, Ohio. "Cleveland."  
Detrick & Harvey Machine Co., Baltimore, Md.  
Flather, The Mark, Planer Co., Nashua, N. H.  
Frevort Machinery Co., 18 Dey St., N. Y. City.  
Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
Gleason Works, The, Brown's Race, Rochester, N. Y. (Bevel gear.)  
Hamilton Machine Tool Co., Hamilton, O.  
Hendey Machine Co., Torrington, Conn.  
Hill, Clarke Co., 156 Oliver St., Boston, Mass.  
Ideal Machine Works, 255-57 39th St., Brooklyn, N. Y. "Ideal." (Hand.)  
Krecht Planer Co., The, 819 Wade St., Cincinnati, O.  
McCabe, J. J., 30 Church St., N. Y. City.  
McCabe Machine Co., 95 Liberty St., N. Y. City.  
Manning, Maxwell & Moore, Inc., N. Y. City.  
Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
Motch & Merryweather Machinery Co., 707-715 Lakeside Ave., N. W., Cleveland, O.  
New Haven Mfg. Co., New Haven, Conn.  
Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa. (Portable & crank.)  
Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
Ohio Machine Tool Co., Kenton, O.  
Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
Putnam Machine Co., 10 to 100 Putnam St., Fitchburg, Mass.  
Rockford Machine Tool Co., Rockford, Ill. "Rockford."

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**PLANERS, Metal—Continued**

- Sargeant & Co., 94 Centre St., N. Y. City.  
 Sellars, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
 Shepard Lathe Co., 141 W. 2nd St., Cincinnati, Ohio.  
 Tanite Co., The, Stroudsburg, Pa. "Tanite."  
 Somers, Fittler & Tood Co., 327 Water St., Pittsburg, Pa.  
 ★Toomey, Frank, 131 N. Third St., Phila., Pa. (New & second-hand.)  
 Walker, O. S. & Co., 25 Union St., Worcester, Mass. "Parallels."  
 Whitcomb-Blaisdell Machine Tool Co., 134 Gold St., Worcester, Mass.  
 Wilkinson, A. J. & Co., 180-88 Washington St., Boston, Mass. "A. J. W. & Co." (Hand & power.)  
 Wilson, W. A. Machine Co., Rochester, N. Y.  
 Woodward & Powell Planer Co., 97-99 Webster St., Worcester, Mass. (Fluting & duplex.)  
 Wormer, C. C. Machinery Co., Detroit, Mich.

**PLANERS, Wood**

- American Sawmill Machinery Co., Hacketts-town, N. J. "American."  
 American Wood Working Machinery Co., Rochester, N. Y.  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich.  
 Bentel & Margedant Co., The, Hamilton, O. "Hamilton."  
 Colladay, Jas. O. & Co., 624-26 Race St., Phila., Pa.  
 Connell & Dengler Machine Co., 254 Mill St., Rochester, N. Y.  
 Cordesman-Rechtin Co., Cincinnati, Ohio. "Cordesman-Rechtin."  
 Crescent Machine Co., Leetonia, O. "Crescent."  
 Greenlee Bros. & Co., Rockford, Ill. "Greenlee."  
 Falls Machine Co., Sheboygan Falls, Wis. "Falls."  
 Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
 Hall & Brown Wood Working Machine Co., 1913-29 Broadway, St. Louis, Mo. (Hand & power.)  
 Lovell Machine Works, Gardner, Mass.  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Porter, C. O. Machinery Co., Grand Rapids, Mich.  
 Power, L. & Co., Phila., Pa. (Wood.)  
 Ross, Josiah Mfg. Co., 1443-59 Niagara St., Buffalo, N. Y.  
 Safety Emery Wheel Co., Springfield, O.  
 Sidney Tool Co., The, Sidney, Ohio. "Sidney."  
 Silver Mfg. Co., Salem, O. "Silver."  
 Smith, H. B. Machine Co., Smithville, N. J.  
 White, Jno. A. Co., Dover, N. H.  
 Whitney, Baxter D. & Sons, Winchenden, Mass.  
 Yerkes & Finan Woodworking Machine Co., St. Louis, Mo.

**PLANNER TOOLS**

(See Tools, Machinery.)

**PLANNER TOOL HOLDERS**

(See Tool Holders.)

**PLATING OUTFITS**

(See also Polishing &amp; Buffing Machines.)

- ★Bennett-O'Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill.  
 Hanson & Van Winkle Co., Newark, N. J. (Electro-plating & electro-galvanizing outfits.)

**PLIERS**

- Athol Machine Co., Athol, Mass.  
 Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.  
 Bonner, C. E. Mfg. Co., Chrisman, Ill. "Victor."  
 Bonney Vise & Tool Works, Allentown, Pa. "Bonney." (Combination.)  
 Bridgeport Hardware Mfg. Corp., Bridgeport, Conn. (Also "Hercules" nippers.)  
 Cincinnati Tool Co., Norwood, O.  
 Crescent Tool Co., Jamestown, N. Y. "Crescent" & "Simplex." (Combination.)  
 Cronk & Carrier Mfg. Co., Elmira, N. Y. "Cronk."  
 Danielson, J. P. & Co., Jamestown, N. Y.  
 Dudley Tool Co., Menominee, Mich.  
 Elmore Tool Mfg. Co., The, Hartford, Conn. "Elmore."  
 Erie Tool Works, Erie, Pa.  
 Hall, Chas. E. Co., 106 Broadway, Buffalo, N. Y. (Combination.)  
 Herbrand Co., Fremont, O.  
 Hjorth, Wm. & Co., Jamestown, N. Y. (Combination.)  
 Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn. "Reliance." (Combination.)  
 Knights Combination Tool Co., 257-63 George St., New Haven, Conn. "Knight."  
 Kraeuter & Co., Inc., 571-9 18th Ave., Newark, N. J.  
 Lowentraut, P. Mfg. Co., Newark, N. J. "U. S."  
 Noonon Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Reed Mfg. Co., Erie, Pa. "Reed."  
 Roren Drop Forge Co., Providence, R. I.  
 Schollhorn, Wm. Co., New Haven, Conn. "Bernard."  
 Stortz, John & Son, 210 Vine St., Phila., Pa.  
 Utica Drop Forge & Tool Co., 800 Whitesboro St., Utica, N. Y. "Utica." (Pliers & nippers.)  
 Vaughan & Bushnell Mfg. Co., Chicago, Ill. "H. B."  
 Wiebusch & Hilger, 106-10 Lafayette St., N. Y. City. (Hilger & Sons' pliers & nippers, imported.)

**PNEUMATIC TOOLS**

- Blaisdell Machinery Co., The, Bradford, Pa.  
 Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, O. "Cleveland."  
 Dayton Pneumatic Tool Co., Dayton, O. "Dayton."  
 Helwig Mfg. Co., St. Paul, Minn. "Helwig."  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor." (Drills.)  
 Ingersoll-Rand Co., 11 Broadway, N. Y. City. "Crown" & "Imperial."  
 Oldham, Geo. & Sons Co., 1828 John St. Frankford, Phila., Pa.  
 Pittsburg Pneumatic Co., 90 West St., Canton, Ohio. "Pittsburg."  
 Standard Railway Equipment Co., St. Louis, Mo. "Monarch."

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 Blount, C. J. Co., Everett, Mass.  
 Bridgeport Safety Emery Wheel Co., The, Inc., Bridgeport, Conn.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Builders' Iron Foundry, Providence, R. I.  
 Chicago Machine Tool Co., Chicago, Ill. (Buffers.)

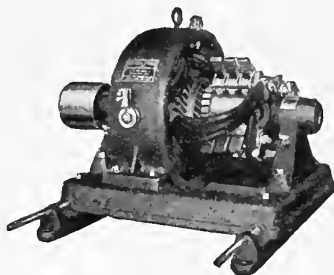
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- Foot Mfg. Co., Jersey City, N. J.
- Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.
- Frevort Machinery Co., 18 Dey St., N. Y. City. (Polishing.)
- ★General Electric Co., Schenectady, N. Y. "G. E." (Electric buffer & grinder.)
- Hanson & Van Winkle Co., Newark, N. J.
- Huntsville Foundry & Machine Works, Huntsville, Ala.
- Leiman Bros., 62 John St., N. Y. City.
- Middleditch, B., Detroit, Mich.
- New Britain Machine Co., The, New Britain, Conn.
- Oliver, W. W. Mfg. Co., Buffalo, N. Y.
- Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O. "Osborn."
- ★Roth Bros. & Co., 1374 W. Adams St., Chicago, Ill. "Roth." (Electric.)
- Sibley-Houffley Machine Co., The, 180 Brush St., Detroit, Mich. "Garland."
- Springfield Mfg. Co., Springfield, Mass.
- Stow Flexible Shaft Co., 26th & Callowhill Sts., Phila., Pa. (Portable.)
- Stow Mfg. Co., Schenectady, N. Y. (Portable electric.)
- Tanite Co., The., Stroudsburg, Pa. "Tanite."
- Tucker Machine Co., 224 E. Ninth St., Cincinnati, O.

Victor Electric Co., 55-61 Market St., Chicago, Ill. "Victor."

Webster & Perks Tool Co., Springfield, O.

## POLISHING COMPOUNDS

- ★Bennett-O-Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill. "Mascot."
- Easton Polishing Supply Co., Easton, Pa.
- Matchless Metal Polish Co., N. Y. City. "White Diamond" & "Rouges."
- New Era Mfg. Co., The, Kalamazoo, Mich. "New Era."
- Stevens, Frederic B., Detroit, Mich. "Stevens' Tripoli Composition," "White Rose," "White Columbia Coloring," "Emery Cake" & "Stevens' Silver Finish."
- Tanite Co., The, Stroudsburg, Pa.

## POLISHING WHEELS

- ★Bennett-O-Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill. (Felt, canvas, wood, etc.; also cotton buffs, sewed & loose.)
- Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill. "Chicago."
- Divine Bros. Co., Utica, N. Y.
- Eastern Felt Co., Winchester, Mass. (Felt.)
- Easton Polishing Supply Co., Easton, Pa.
- Hanson & Van Winkle Co., Newark, N. J. "Universal."
- Kortum Mfg. Co., 10-12 Pearl St., Buffalo, N. Y. (Also buffs.)
- Stevens, Frederic B., Detroit, Mich.

## PORTABLE DRILLS

Cincinnati Electrical Tool Co., 650 Evans St., Cincinnati, O.

**PORTABLE DRILLS—Continued**

Clark, James, Jr., Electric Co., 520 W. Main St., Louisville, Ky. "Willey."  
 Hisey-Wolf Machine Co., Cincinnati, O. "Hisey." (Electric.)  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor."  
 Stow Flexible Shaft Co., 26th & Callowhill Sts., Phila., Pa.  
 Stow Mfg. Co., Binghamton, N. Y.  
 U. S. Electrical Tool Co., 1938 W. 8th St., Cincinnati, O.  
 Valve Seating Tool Co., Bridgeport, Conn. "Pioneer." (Electric drills.)  
 Warner-Smith Lektro Products Co., The, Room 500, Neave Bldg., Cincinnati, Ohio. "Lektro." (Electric.)

**PORTABLE GRINDERS**

Armstrong-Blum Mfg. Co., 339-57 N. Francisco Ave., Chicago, Ill. "Marvel."  
 Chicago Pneumatic Tool Co., Chicago, Ill. (Electric.)  
 Cincinnati Electric Tool Co., 650 Evans St., Cincinnati, O.  
 Clark, James, Jr. Electric Co., 520 W. Main St., Louisville, Ky.  
 Coates Clipper Mfg. Co., 237 Chandler St., Worcester, Mass. (Motor driven.)  
 Helwig Mfg. Co., St. Paul, Minn. "Helwig." (Pneumatic.)  
 Hisey-Wolf Machine Co., Cincinnati, Ohio. "Hisey." (Electric.)  
 Stow Flexible Shaft Co., 26th & Callowhill Sts., Phila., Pa.  
 Stow Mfg. Co., Binghamton, N. Y. (Rope driven & electric.)  
 Warner-Smith Lektro Products Co., The, Room 500, Neave Bldg., Cincinnati, Ohio. "Lektro." (Electric.)

**POTASH KETTLES**

(See Soda and Potash Kettles.)

**POWER HACK SAWS**

(See Hack Saws, Power.)

**POWER HAMMERS**

(See Hammers, Steam, Drop & Power.)

**PRESSES, Arbor**

(See Arbor Presses.)

**PRESSES, Foot and Hand**

Atlas Machine Co., The, 31 Canal St., Waterbury, Conn. (Screw.)  
 Automatic Machine Co., Bridgeport, Conn. (Hand.)  
 Baird Machine Co., The, Oakville, Conn.  
 Consolidated Press & Tool Co., Hastings, Mich.  
 Ferracute Machine Co., Bridgeton, N. J. (Foot.)  
 Geier, P. A. Co., The, 5112 St. Clair Ave., Cleveland, O. "Geier." (Bench straightening.)  
 Hibbard, Wm. H. Mfg. Co., Brooklyn, N. Y.  
 Leonard Mfg. Co., Providence, R. I. "Costello." (Foot.)  
 Loy & Naurath Co., 21-29 Runyon St., Newark, N. J.  
 Ohl, Geo. A. & Co., 157-161 Oraton St., Newark, N. J.  
 Taylor & Fenn Co., Hartford, Conn.  
 V. & O. Press Co., The, Glendale, L. I., N. Y. "V. & O."

**PRESSES, Power**

Adriance Machine Works, Brooklyn, N. Y.  
 American Can Co., Merchants' Loan & Trust Bldg., Chicago, Ill.  
 Atlas Machine Co., The, 31 Canal St., Waterbury, Conn. (Screw.)  
 Automatic Machine Co., The, Bridgeport, Conn.  
 Baird Machine Co., The, Oakville, Conn.  
 Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y.  
 Cady Machine Co., The, 968 E. 69th Place, Cleveland, O.  
 Chambersburg Engineering Co., Chambersburg, Pa. (Pneumatic & hydraulic.)  
 Cleveland Punch & Shear Works, Cleveland, Ohio.  
 Consolidated Press & Tool Co., Hastings, Mich.  
 Coulter & McKenzie Machine Co., Bridgeport, Conn.  
 Dill, T. C. Machine Co., Inc., Somerset, Mascher & Mutter Sts., Phila., Pa.  
 Elmes, Chas. F. Engineering Works, Cor. Morgan & Fulton Sts., Chicago, Ill. (Hydraulic, forcing & wheel.)  
 Ferracute Machine Co., Bridgeton, N. J.  
 Hibbard, Wm. H. Mfg. Co., Brooklyn, N. Y.  
 Lefler, Chas. & Co., 49-61 Clymer St., Brooklyn, N. Y.  
 Loy & Naurath Co., 21-29 Runyon St., Newark, N. J.  
 Lucas Machine Tool Co., Cleveland, O. "Lucas." (Forcing.)  
 Manville Bros. Co., Waterbury, Conn. "Yankee."  
 Manville, E. J. Machine Co., Waterbury, Conn.  
 Motch & Merryweather Machinery Co., The, 707-15 Lakeside Ave., N. W., Cleveland, O.  
 Niagara Machine & Tool Works, Jefferson, Superior & Randall Sts., Buffalo, N. Y. "Niagara."  
 Perkins Machine Co., Warren, Mass. "Perkins."  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Robinson, The J. M. Mfg. Co., Cincinnati, O. (Punching presses.)  
 Schulz, Fritz A., 218-30 N. Jefferson St., Chicago, Ill. "Schulz."  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Hydraulic.)  
 Springfield Machine Tool Co., Springfield, O.  
 Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Automatic.)  
 Stoll, D. H. Co., 36 Lansing St., Buffalo, N. Y. (Stamping.)  
 Swaine, The Fred J. Mfg. Co., St. Louis, Mo.  
 Toledo Machine & Tool Co., The, Toledo, O. (Drop forge trimming & toggle drawing presses.)  
 V. & O. Press Co., The, Glendale, L. I., N. Y. "V. & O."  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. "Waterbury."  
 Waterbury Machine Co., Waterbury, Conn.  
 Watson-Stillman Co., Hudson Terminal Bldg., N. Y. City. (Hydraulic.)  
 Williams, White & Co., Moline, Ill. (Hydraulic.)  
 Zeh & Hahnemann Co., Ave. A & Vanderpool St., Newark, N. J.

**PROFILING MACHINES**

American Watch Tool Co., Elm St., Waltham, Mass.  
 Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa.

**PULLERS, Wheel**

(See Wheel Pullers.)



**PUMPS, Garage (Tire)**

- Allis-Chalmers Co., Milwaukee, Wis.  
 Artizan Brass Co., 204 Lincoln Park Blvd., Chicago, Ill. "A.B.C." (Air supply system.)  
 Auburn Auto-Pump Co., 1 Mason Lane, Auburn, N. Y.  
 ★Clayton Air Compressor Works, The, 115 Broadway, N. Y. City. "Clayton."  
 Cleveland Faucet Co., 708 Frankfort Ave., N. W., Cleveland, O. "Champion."  
 Gardner Governor Co., Quincy, Ill. "Gardner," "Goulds."  
 Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y. "G-P."  
 ★Globe Mfg. Co., Battle Creek, Mich. "Globe." (Electric & hand lever, for use with tanks or direct into tire.)  
 ★Goulds Mfg. Co., The, Seneca Falls, N. Y. "Goulds."  
 ★Herz & Co., 203-205 Lafayette St., N. Y. City. "E.B.B."  
 ★Holtzer-Cabot Electric Co., The, Boston, Mass. (Electric.)  
 ★Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill. "Imperial Compound."  
 Martin & Anson Co., 2226-8 Indiana Ave., Chicago, Ill.  
 Portland Garage, Portland, Me.  
 ★Rohrbacher Automatic Air Pump Co., 173 E. Water St., Portland, Ore. "Rohrbacher."  
 Star Brass Works, The, 123 N. Jefferson St., Chicago, Ill. "Binks."  
 Stevens & Co., 375 Broadway, N. Y. City.  
 Victor Electric Co., 55-61 Market St., Chicago, Ill. "Victor." (Electric.)

**PUMPS, Power, Stationary**

(See Air Compressors.)

**PUNCHES, Centre**

- Braunsdorf-Mueller Co., Elizabeth, N. J. (Center & prick.)  
 Browne & Dowd Mfg. Co., Meriden, Conn. (Center & prick.)  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 ★Buffum Tool Co., Louisiana, Mo.  
 Carver Tool Works, Spring Valley, N. Y. (Center, prick & drive.)  
 Deuse, J. S., Chester, Conn. (Center & prick.)  
 Goodell-Pratt Co., Greenfield, Mass. (Center & prick.)  
 Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y. "Keystone."  
 Marcy Tool Works, Putnam Conn. (Round square & prick.)  
 Mayhew, H. H. Co., Shelburne Falls, Mass. "Mayhew." (Center & prick.)  
 Sawyer Tool Mfg. Co., Fitchburg, Mass. (Also nail sets.)  
 Starrett Co., L. S., Athol, Mass.  
 Stortz, John & Son, 210 Vine St., Phila., Pa.  
 Syracuse Twist Drill Co., Syracuse, N. Y.  
 Welch, Thos. F. Co., 55 Sudbury St., Boston, Mass.

**PUNCHES, Foot**

- Clough, R. M., Tolland, Conn.  
 Pettingill Machine Co., The, 79 Elm St., Amesbury, Mass.

**PUNCHES, Hand**

- American Lock Nut Co., Oregon, Ill. "Lightning."  
 American Watch Tool Co., Elm St., Waltham, Mass.  
 Armstrong-Blum Mfg. Co., 339-57 N. Francisco Ave., Chicago, Ill. "Marvel." (Lever.)  
 Badger State Machine Co., Janesville, Wis.  
 Buck Bros., Millbury, Mass.  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."

- Cronk & Carrier Mfg. Co., Elmira, N. Y. "Elmore." (Also nail sets.)  
 Deuse, J. S., Chester, Conn. (Nail sets.)  
 Elmore Tool Mfg. Co., The, Hartford, Conn. "Elmore."  
 Evansville Tool Works, Evansville, Ind. "E. T. W."  
 Gem Tool Works, 2 Hudson St., N. Y. City. "Samipson."  
 Harvey, Arthur C. Co., 374 Congress St., Boston, Mass.  
 Heartley Machine, Variety Iron & Tool Works, 900-908 Summit St., Toledo, O.  
 Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y. "Keystone." (Nail punches.)  
 Kidder, J. F. Mfg. Co., Burlington, Vt. "Little Blacksmith." (Also combined punches, shears & benders.)  
 Kraeuter & Co., Inc., 571-79 18th Ave., Newark, N. J. (Also belt punches.)  
 Little Giant Punch & Shear Co., Sparta, Ill. "Little Giant."  
 Lowentraub, P. Mfg. Co., Newark, N. J. "U. S." (Revolving.)  
 Massachusetts Saw Works, Chicopee, Mass. "Victor." (Nail sets.)  
 Niagara Machine & Tool Works, Jefferson, Superior & Randall Sts., Buffalo, N. Y. "Niagara."  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y. "Noonan's."  
 Novelty Iron Works, Dubuque, Iowa. "Victor."  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Queen City Punch & Shear Co., 208-12 Lawrence St., Cincinnati, O.  
 Schatz Mfg. Co., The, Poughkeepsie, N. Y. "Schatz."  
 Starrett, L. S. Co., Athol, Mass. (And nail sets.)  
 Tuck Mfg. Co., 74 Ames St., Brockton, Mass. (Also nail sets.)  
 Whitney, W. A. Mfg. Co., Rockford, Ill. "Whitney." (Portable.)

**PUNCHES, Lever**

- Badger State Machine Co., Janesville, Wis.

**PUNCHES, Power**

- American Can Co., Merchants' Loan & Trust Bldg., Chicago, Ill.  
 ★American Die & Tool Co., Reading, Pa.  
 American Watch Tool Co., Elm St., Waltham, Mass.  
 Badger State Machine Co., Janesville, Wis.  
 Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y.  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Cincinnati Punch & Shear Co., Cincinnati, O.  
 Cleveland Punch & Shear Works, Cleveland, O.  
 Consolidated Press & Tool Co., Hastings, Mich.  
 Ferracute Machine Co., Bridgeton, N. J.  
 Frevert Machinery Co., 18 Dey St., N. Y. City.  
 Heartley Machine, Variety Iron & Tool Works, 900-908 Summit St., Toledo, O.  
 Kane & Roach, Syracuse, N. Y.  
 Lansing Machine Co., Lansing, Mich.  
 Long & Allstatter Co., Hamilton, O.  
 Loy & Naurath Co., 21-29 Runyon St., Newark, N. J. (Combined punch & shears; gang punches.)  
 McCabe, J. J., 30 Church St., N. Y. City.  
 Mitts & Merrill, Saginaw, Mich.  
 New Doty Mfg. Co., Janesville, Wis.  
 Niagara Machine & Tool Works, Jefferson, Superior & Randall Sts., Buffalo, N. Y. "Niagara."  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Perkins Machine Co., Warren, Mass. "Perkins."  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.

**PUNCHES, Power—Continued**

Queen City Punch & Shear Co., 208-12 Lawrence St., Cincinnati, O.  
 Royersford Foundry & Machine Co., Royersford, Pa.  
 Schatz Mfg. Co., The, Poughkeepsie, N. Y. "Schatz."  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Hydraulic & power.)  
 Stein, Wm. P. & Co., 282 State St., Rochester, N. Y.  
 Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Automatic.)  
 Toledo Machine & Tool Co., Toledo, O.  
 Whiting, Geo. Co., 1417 W. North Ave., Chicago, Ill.  
 Williams, White & Co., Moline, Ill.

**PYROMETERS**

Bristol Co., Waterbury, Conn.  
 Brown, Edward & Son, Phila., Pa. "Brown."  
 Central Laboratory Supply Co., La Fayette, Ind.  
 Du Vivier, Ernest H., N. Y. City. (Importer.)  
 Engelhard, Chas., 32 Cortlandt St., N. Y. City. "Heraeus Le Chatelier." (Imported.)  
 Esterline Co., The, 112 W. Main St., La Fayette, Ind.  
 Hoskins Mfg. Co., Detroit, Mich. "Hoskins." (Thermo-electric.)  
 Thwing, C. B., Phila., Pa.  
 Uehling Instrument Co., Passaic, N. J.  
 Wilson-Maculen Co., N. Y. City. "Advance" & "Le Chatelier."  
 Zaubitz, August, 95-97 Cliff St., N. Y. City.

**RADIAL DRILLS**

★American Tool Works Co., 6th & Eggleston Ave., Cincinnati, O.  
 Cincinnati-Bickford Tool Co., The, Spring Grove Ave. & Township St., Cincinnati, Ohio.  
 Clark, James, Jr., Electric Co., 520 W. Main St., Louisville, Ky. "Willey."  
 Fitchburg Machine Works, Fitchburg, Mass. "Fitchburg."  
 Fosdick Machine Tool Co., Blue Rock & Apple Sts., Cincinnati, O.  
 Gang, Wm. E. Co., 1543-47 Queen City Ave., Cincinnati, O.  
 Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
 Hamilton Machine Tool Co., Hamilton, O.  
 Harrington, Edwin, Son & Co., 17th & Callowhill Sts., Phila., Pa.  
 Hilbert Machine Co., The, 2116-22 Colerain Ave., Cincinnati, O.  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
 Morris, The John B. Foundry Co., Cincinnati, Ohio. "Morris."  
 Motch & Merryweather Machinery Co., The, 707-715 Lakeside Ave., N. W., Cleveland, Ohio.  
 Mueller Machine Tool Co., The, 2427-29 Colerain Ave., Cincinnati, O. "Mueller."  
 National Equipment Co., Springfield, Mass.  
 Prentiss Tool & Supply Co., 116 Liberty St., New York, N. Y.  
 Western Machine Tool Works, Holland, Mich. "Western."

**RATCHETS FOR TOOLS**

Parker, Chas. Co., Meriden, Conn.  
 Syracuse Wrench Co., Franklin & Water Sts., Syracuse, N. Y. "Empire." (Drill.)

**RATCHET DRILLS**

Armstrong Bros. Tool Co., Chicago, Ill.  
 Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 Goodell-Pratt Co., Greenfield, Mass.  
 Hunter, James Machine Co., North Adams, Mass.  
 Keystone Mfg. Co., The, 41-51 Chandler St., Buffalo, N. Y. "Keystone," "Weston" & "Monarch."  
 Lowell Wrench Co., 100 Exchange St., Worcester, Mass.  
 Ohlen, James & Sons Saw Mfg. Co., Columbus, O.  
 Pancoast, Henry B. Co., 2110 Allegheny Ave., Phila., Pa. "Smith's."  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City. "Renshaw."

**REAMERS**

★American Die & Tool Co., Reading, Pa.  
 American Specialty Co., 834-35 Mondanock Bldg., Chicago, Ill. "S. H. Co." (Adjustable.)  
 Armstrong Mfg. Co., 295 Knowlton St., Bridgeport, Conn. "Armstrong." (Pipe.)  
 Boker, Herman & Co., 101 Duane St., N. Y. City.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Brubaker, W. L. & Bro., Millersburg, Pa.  
 Buck Bros., Millbury, Mass.  
 Butterfield & Co., Derby Line, Vt.  
 Cleveland Pneumatic Tool Co., The, 6410 Hawthorne Ave., Cleveland, O. "Cleveland." (Pneumatic.)  
 Cleveland Twist Drill Co., Cleveland, O.  
 Clough, R. M., Tolland, Conn. (Adjustable & expansion.)  
 Detroit Twist Drill Co., 634-46 Fort St., W., Detroit, Mich.  
 Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. "Geometric." (Adjustable.)  
 Grant Nail & Supply Co., Boston, Mass. "Turney."  
 Hollands Mfg. Co., Erie, Pa. (Pipe.)  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. "Thor." (Pneumatic.)  
 La Pointe Machine Tool Co., Hudson, Mass.  
 Lord, L. L. Co., Meadville, Pa. "Lord." (Pipe.)  
 McCrosky-Reamer Co., The, Meadville, Pa. "McCrosky." (Adjustable.)  
 Meyer Reamer Co., 1539 Buhner Ave., Cleveland, O. "Meyer Expansion."  
 Morse Twist Drill & Machine Co., New Bedford, Mass.  
 National Twist Drill & Tool Co., Detroit, Mich.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Reece, E. F. Co., Greenfield, Mass. "Hercules."  
 Rogers, Jno. M. Works, Gloucester, N. J. (Adjustable blade & solid.)  
 Schellenback-Hunt Tool Co., Cincinnati, O. (Adjustable blade.)  
 Smith, Wm. J. Co., 424 State St., New Haven, Conn. "One-Lock." (Adjustable.)  
 Standard Tool Co., Cleveland, O.  
 Tuck Mfg. Co., 74 Ames St., Brockton, Mass. "Tuck."  
 Walworth Mfg. Co., 128 Federal St., Boston, Mass.  
 Wells Bros. Co., Greenfield, Mass. "Little Giant."  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "National."  
 Wiley & Russell Mfg. Co., Greenfield, Mass. "Lightning" & "Green River."

**REAMER & CUTTER GRINDERS**

Bath Grinder Co., 67 Walnut St., Fitchburg, Mass.  
 Cincinnati Milling Machine Co., The, Cincinnati, O.  
 Greenfield Machine Co., 29 Mill St., Greenfield, Mass. "Greenfield."  
 Ingersoll Milling Machine Co., The, Rockford, Ill. (Cutter grinders.)  
 LeBlond, The R. K. Machine Tool Co., 4609 Eastern Ave., Cincinnati, O.  
 McCabe, J. J., 30 Church St., N. Y. City.  
 National Machine Co., The, Hartford, Conn.  
 Oesterlein Machine Co., The, Cincinnati, O. "Oesterlein."  
 Wells, F. E. & Son Co., Greenfield, Mass. "Wells."  
 Woods Engineering Co., Alliance, O.

**RECTIFIERS, Alternating Current**

(See Current Rectifiers.)

**REPAIR COUCHES**

(See Chauffeurs' Trucks.)

**REVOLUTION COUNTERS**

Grant Mfg. & Machine Co., The, 90 Silliman Ave., Bridgeport, Conn. "Tabor."  
 Industrial Instrument Co., Foxboro, Mass. "Standard."  
 Keuffel & Esser Co., 127 Fulton St., N. Y. City.  
 Schaeffer & Budenberg Mfg. Co., 963-5 Kent Ave., Brooklyn, N. Y. "S. & B." (Engine.)  
 Starrett, L. S. Co., Athol, Mass.  
 Schuchardt & Schutte, 90 West St., N. Y. City. "Initiative."  
 Veeder Mfg. Co., Sargeant & Garden Sts., Hartford, Conn. "Veeder."  
 ★ Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis. "Warner." (Tachometer.)  
 Waterhouse Co., The, 6 Pelham St., Boston, Mass.

**RING GRINDERS**

(See Piston Ring Grinders.)

**RIVET CLIPPERS**

(See Bolt &amp; Rivet Clippers.)

**RIVETING MACHINES**

Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Hubbell, Harvey, Inc., Bridgeport, Conn. "Hubbell."  
 Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill. (Pneumatic.)  
 Long & Allstatter Co., Hamilton, O.  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Hydraulic, pneumatic and steam.)  
 Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.  
 Shuster, The F. B. Co., 133 Mill River St., New Haven, Conn. (Elastic rotary mow.)  
 Townsend, H. P. Mfg. Co., Hartford, Conn.  
 Whiting, Geo. Co., 1417 W. North Ave., Chicago, Ill.

**RIVET SETS**

Carver Tool Works, Spring Valley, N. Y.  
 Drew, C. & Co., Kingston, Mass.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Vaughan & Bushnell Mfg. Co., Chicago, Ill.

**ROOFING**

Asphalt Ready Roofing Co., 136 Water St., N. Y. City. ("Perfection Brand," "Arrow Brand" & "Stoneheage" asphalt; "Hudson Brand" asphalt felt, "B. B. Asphaltum" roof paints; asphalt roofing cement, coal tar, coal tar pitch, roofing nails, etc.)  
 Berger Mfg. Co., Canton, O. (Metal.)  
 Carey, Philip Mfg. Co., Lockland, O. "Carey's." (Flexible cement.)  
 ★ Johns-Manville, H. W. Co., 100 William St., N. Y. City. (Asbestos.)  
 Union Paper & Twine Co., 45 Larnard St., W., Detroit, Mich. "Letheroid." (Prepared roofing.)

**RUBBING STONES**

American Stone Co., New Albany, Ind. "American."  
 Carborundum Co., The, Niagara Falls, N. Y. (Carborundum sharpening stones.)  
 Eureka Rubbing Stone Co., Chicago, Ill.  
 Norton Grinding Co., Barbers Crossing, Worcester, Mass. "Alundum." (Grinding, rubbing & sharpening stones.)  
 Peninsular Emery Wheel Co., Detroit, Mich. (Emery bricks & rub stones.)  
 Rodriguez, R. E., 56-58 Warren St., N. Y. City. "Gamburger Blmsstein." (Composition pumice stones.)  
 Rhodes, J. H. & Co., Chicago, Ill. (Imported.)

**SANDERS**

American Wood Working Machinery Co., Rochester, N. Y.  
 Bentel & Margendant Co., The, Hamilton, Ohio. "Hamilton."  
 Black Bros. Machinery Co., Mendota, Ill.  
 Clemons Machine Co., Hornell, N. Y. "Clemons." (Belt.)  
 Cordesman-Rechtin Co., Cincinnati, Ohio. "Cordesman-Rechtin."  
 Driver, C. H., 1320 16th St., Racine, Wis. "Wonder" & "Driver." (Belt.)  
 Gilmer, L. H. Co., 52 N. 7th St., Phila., Pa. "Gilmer." (Belt sander & polisher.)  
 Hall & Brown Wood Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo.  
 Rowbottom Machine Co., The, Waterbury, Conn.  
 ★ Oliver Machinery Co., Grand Rapids, Mich.  
 Smith, H. B. Machine Co., Smithville, N. J.  
 West Side Iron Works, 31-33 S. Front St., Grand Rapids, Mich. (Belt.)  
 White, John A. Co., Dover, N. H.

**SAND BLASTS**

Curtis & Co. Mfg. Co., Willston, Mass.  
 Drucklieb, C., 178 Washington St., N. Y. City.  
 Jern, A., Jr., Waukegan, Ill. "Jern."  
 Leiman Bros., 62 John St., N. Y. City.  
 Macleod, Walter & Co., Cincinnati, Ohio. "Buckeye."  
 Nichols, D. M. Iron Works, 2-4 Gouverneur Slip, N. Y. City. "Danic."  
 Obermayer, S. Co., Cincinnati, O.  
 Pangborn, Thos. W. Co., 90 West St., N. Y. City. "Pangborn Modern."  
 Paxson, J. W. Co., 1019 N. Delaware Ave., Phila., Pa.  
 Tilghman-Brooks Sand Blast Co., Phila., Pa.

**SAWS, Metal, Hand**

(For Power Metal Saws, See Hack Saws, Power.)  
 Athol Machine Co., Athol, Mass. (Hack saw blades.)

**SAWS, Metal, Hand—Continued**

Atkins, E. C. & Co., Indianapolis, Ind. (Also "Silver Steel" hack saw frames.)  
 Bishop, Geo. H. & Co., Lawrenceburg, Ind.  
 Diamond Saw & Stamping Co., Buffalo, N. Y.  
 "Sterling." (Hack saw frames & blades.)  
 Disston, Henry & Sons, Inc., Tacony, Phila., Pa. "Disston."  
 Goodell-Pratt Co., Greenfield, Mass. (Hack saw frames & blades.)  
 Griffin, G. W. Co., Franklin, N. H. (Hack saw blades & frames.)  
 Harris & Reed Mfg. Co., 1500-1518 W. 15th St., Chicago, Ill.  
 Jennings, C. E. & Co., 42 Murray St., N. Y. City. (Hack saws & frames.)  
 Massachusetts Saw Works, Chicopee, Mass.  
 "Victor." (Hack saw frames & blades.)  
 Maxwell & Fitch Co., The, Rome, N. Y. (Saw frames.)  
 Millers Falls Co., 28 Warren St., N. Y. City. "Star."  
 Ohlen, James & Sons Saw Mfg. Co., Columbus, O.  
 Sawyer Tool Mfg. Co., Fitchburg, Mass. (Hack saw frames.)  
 Simonds File Co., Fitchburg, Mass. ("Simonds Bay State" & "Culley"; "Simonds" hack saw frames.)  
 Starrett, L. S. Co., Athol, Mass.  
 Tabor Mfg. Co., 18th & Hamilton Sts., Phila., Pa. "Taylor-Newbold."  
 Taylor-Shantz Co., 230 Mill St., Rochester, N. Y.  
 Thompson, Henry G. & Son Co., New Haven, Conn. (Hack saw frames.)  
 Union Hardware Co., Torrington, Conn.  
 "Union," "Crown" & "Eagle." (Hack saw frames.)  
 Union Twist Drill Co., Athol, Mass. (Metal slitting saws.)  
 West Haven Mfg. Co., 22 Elm St., New Haven, Conn. "Universal" & "Utility." (Hack saw blades & frames.)

**SAWING MACHINES, Metal**

Cochrane-Bly Co., Rochester, N. Y.

**SAW TABLES**

American Sawmill Machinery Co., Hacketts-town, N. J. "American." (Circular.)  
 American Wood Working Machinery Co., Rochester, N. Y. (Circular.)  
 Badger State Machine Co., Janesville, Wis.  
 Baker Bros., Toledo, O.  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich.  
 Beach Mfg. Co., Montrose, Pa. (Circular.)  
 Bentel & Margedant Co., The, Hamilton, O. "Hamilton."  
 Colburn Machine Tool Co., Franklin, Pa.  
 Colladay, Jas. O. Co., 624-26 Race St., Phila., Pa. (Circular.)  
 Connell & Dengler Machine Co., 254 Mill St., Rochester, N. Y.  
 Crescent Machine Co., The, Leetonia, Ohio. "Crescent."  
 Hayes Machine Co., 136 Liberty St., N. Y. City. (Circular.)  
 Lovell Machine Works, Gardner, Mass.  
 Marston, J. M. & Co., 226 Ruggles St., Boston, Mass. (Circular.)  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Pettingill Machine Co., The, 79 Elm St., Amesbury, Mass.  
 Power, L. & Co., Phila., Pa. (Circular.)  
 Root, B. M. Co., York, Pa.  
 Ross, Josiah Mfg. Co., 1443-59 Niagara St., Buffalo, N. Y.  
 Sidney Tool Co., The, Sidney, O. "Sidney."  
 Smith, H. B. Machine Co., Smithville, N. J.  
 U. S. Machine Co., Williamsport, Pa. (Circular.)  
 West Side Iron Works, 31-33 S. Front St., Grand Rapids, Mich.  
 White, John A. Co., Dover, N. H.  
 Yerkes & Finan Woodworking Machine Co., St. Louis, Mo. (Circular.)

**SCRAPERS, Bearing**

(See Bearing Scrapers.)

**SCRAPERS, Carbon**

(See Carbon Scrapers.)

**SCREW DRIVERS**

(For Screw Driving Machines, see Machinery, Misc.)

Arcade Mfg. Co., Freeport, Ill.  
 Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. "All Steel."  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 Bridgeport Hardware Mfg. Corp., Bridgeport, Conn. "Autodriver," "Gripsbank," "Perfecto," "Blackstone" & "Challenge."  
 Brown, R. H. & Co., New Haven, Conn. "Clark's."  
 ★Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y. "Buffalo."  
 ★Buffum Tool Co., Louisiana, Mo.  
 Cassady-Fairbank Mfg. Co., The, 6106-6130 La Salle St., Chicago, Ill. "Cassady," "Fairbank," "C. & F. 100," "C. & F. 200," "Premier," "Columbia" & "The Kit."  
 Cincinnati Tool Co., Norwood, O.  
 Cronk & Carrier Mfg. Co., Elmira, N. Y. "Cronk" & "Elmira."  
 Dicke Tool Co., Inc., The, Downers Grove, Ill.  
 Dudley Tool Co., Menominee, Mich.  
 Elmore Tool Mfg. Co., The, Hartford, Conn.  
 "Elmore," "Star," "Indestructible," "Baby," "Nevertum," "Hartford," "Standard" & the "400."  
 Gay, Geo. E., Augusta, Me. "Gay's," "Union" & "Gay's" (combination.)  
 Goodell-Pratt Co., Greenfield, Mass.  
 Jennings, C. E. & Co., 42 Murray St., N. Y. City.  
 Mayhew, H. H. Co., Shelburne Falls, Mass.  
 "Monarch," "Star," "Shepardson" & "Vulcan."  
 Mound Tool & Scraper Co., 1606-1608 N. Broadway, St. Louis, Mo. "Mound."  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.  
 Sawyer Tool Mfg. Co., Fitchburg, Mass.  
 Smith, H. D. & Co., Plantsville, Conn. "Perfect Handle."  
 Starrett, L. S. Co., Athol, Mass.  
 Stortz, John & Son, 210 Vine St., Phila., Pa.  
 "Victor," "Monarch" & "Hercules."  
 Swan, Jas. Co., Seymour, Conn.  
 Tuck Mfg. Co., 74 Ames St., Brockton, Mass. "Tuck."  
 Turner & Deegan, Bristol, Conn.  
 Union Hardware Co., Torrington, Conn. "Champion."  
 Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn. "Sensible."

**SCREW MACHINES**

Automatic Machine Co., The, Bridgeport, Conn.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Cleveland Automatic Machine Co., Cleveland, Ohio.  
 Davis Sewing Machine Co., Dayton, Ohio. "Lester." (Multiple spindle.)  
 Dreeses Machines Tool Co., Cincinnati, O.  
 Flather, E. J. Mfg. Co., Nashua, N. H. "Flather."  
 Frevort Machinery Co., 18 Dey St., N. Y. City.  
 Hartford Machine Screw Co., Hartford, Conn. "Hartford."  
 Jann & Shank Mfg. Co., 617-31 W. Jackson Blvd., Chicago, Ill.  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 National-Acme Manufacturing Co., The, Cleveland, O. "Acme." (Automatic.)

★ indicates Advertisers—see Index in back of book.

**SCREW MACHINES—Continued**

- ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Hand & automatic.)  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Smurr & Kamen Machine Co., 313 N. Sacramento Court, Chicago, Ill.  
 Warner & Swasey Co., Cleveland, O.  
 Wells, F. E. & Son Co., Greenfield, Mass. "Wells."  
 Windsor Machine Co., Windsor, Vt.  
 Wood Turret Machine Co., 14 S. Canal St., Chicago, Ill.

**SCREW PLATES**

(See Taps &amp; Dies.)

**SCRIBERS, Machinists'**

- Braunsdorf-Mueller Co., Elizabeth, N. J.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Goodell-Pratt Co., Greenfield, Mass.  
 Sawyer Tool Mfg. Co., Fitchburg, Mass.  
 Starrett, L. S. Co., Athol, Mass.

**SCROLL SAWS**

- Bentel & Margendant Co., The, Hamilton, O. "Hamilton."  
 Hall & Brown Wood-Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo.  
 Millers Falls Co., 28 Warren St., N. Y. City.  
 Trump Bros. Machine Co., Wilmington, Del. "Fleetwood" & "Dexter."

**SENSITIVE DRILLS**

- Barr, H. G., 21 Hermon St., Worcester, Mass.  
 Cincinnati-Bickford Tool Co., The, Spring Grove Ave. & Township St., Cincinnati, O.  
 Clark, James, Jr., Electric Co., 520 Main St., Louisville, Ky. "Willey."  
 Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
 Hamilton Machine Tool Co., Hamilton, O.  
 Mechanics' Machine Co., Rockford, Ill.  
 Miami Valley Machine Tool Co., Dayton, O. "Miami Valley."  
 National Machine Co., The, Hartford, Conn.  
 Reed, Francis Co., 43 Hammond St., Worcester, Mass.  
 Robertson Mfg. Co., Buffalo, N. Y.  
 Rockford Lathe & Drill Co., Rockford, Ill.  
 St. Louis Machine Tool Co., 1405 S. 7th St., St. Louis, Mo. "St. Louis" & "Coe."  
 Sigourney Tool Co., Hartford, Conn.  
 Townsend, H. P. Mfg. Co., Hartford, Conn. (Foot operated.)  
 Tschudi-McBarron Machine Co., The, Armory Bldg., Dayton, O. "Excelsior."  
 Washburn Shops of the Worcester Polytechnic Institute, The, Worcester, Mass. "Washburn."

**SEWING MACHINES, Leather**

- Singer Sewing Machine Co., N. Y. City.  
 "Singer." (For stitching leather.)

**SHAPERS, Metal**

- ★American Tool Works Co., The, 6th & Eggleston Ave., Cincinnati, O.  
 Boynton & Plummer, 54 Hermon St., Worcester, Mass.  
 Chavant, C. H. & Co., 203 Cator Ave., Jersey City, N. J. (Bench.)  
 Cincinnati Shaper Co., The, Elam St. & Garrard Ave., Cincinnati, O. "Cincinnati."

- Flather, The Mark, Planer Co., Nashua, N. H.  
 Frevert Machinery Co., 18 Dey St., N. Y. City.  
 Garvin Machine Co., Spring & Varriek Sts., N. Y. City.  
 Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J. "High Duty."  
 Hamilton Machine Tool Co., Hamilton, O.  
 Hendey Machine Co., Torrington, Conn.  
 Hill, Clark & Co., 156 Oliver St., Boston, Mass.  
 Juengst, Geo. & Sons, Croton Falls, N. Y.  
 Kelly, The R. A. Co., Xenia, O. (Crank.)  
 Lutter & Gies, 258 Lake St., Milwaukee, Wis. "Milwaukee."  
 McCabe, J. J., 30 Church St., N. Y. City.  
 McCabe Machine Co., 95 Liberty St., N. Y. City.  
 Manning, Maxwell & Moore, Inc., N. Y. City.  
 Marshall & Huschart Machinery Co., 11-15 N. Canal St., Chicago, Ill.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa.  
 Ohio Machine Tool Co., Kenton, O.  
 Pettingill Machine Co., The, 79 Elm St., Amesbury, Mass.  
 Potter & Johnston Machine Co., Pawtucket, R. I.  
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.  
 Queen City Machine Tool Co., N. W. Cor. Sycamore & Webster Sts., Cincinnati, O. "Queen City."  
 Rockford Machine Tool Co., Rockford, Ill. "Rockford."  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
 Shepard Lathe Co., 141 W. 2nd St., Cincinnati, O.  
 Smith & Mills Co., The, Cincinnati, Ohio. (Crank & geared.)  
 Somers, Fidler & Todd Co., 327 Water St., Pittsburg, Pa.  
 Springfield Machine Tool Co., Springfield, O.  
 Steptoe, The John Shaper Co., 2951-61 Colerain Ave., Cincinnati, O. "Steptoe."  
 Stockbridge Machine Co., Worcester, Mass. "Stockbridge." (Two-piece crank.)  
 ★Toomey, Frank, 131 N. 3rd St., Phila., Pa.  
 Walcott & Wood Machine Tool Co., Jackson, Mich. (Triple gear & crank.)

**SHAPERS, Wood**

- Advance Machinery Co., The, Toledo, O.  
 American Wood Working Machinery Co., Rochester, N. Y.  
 Bentel & Margendant Co., The, Hamilton, O. "Hamilton."  
 Colladay, Jas. O. Co., 624-26 Race St., Phila., Pa.  
 Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin."  
 Crescent Machine Co., The, Lectoria, Ohio. "Crescent."  
 Hall & Brown Wood-working Machine Co., 1913-29 N. Broadway, St. Louis, Mo. (Power.)  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Porter, C. O. Machinery Co., Grand Rapids, Mich.  
 Power, L. & Co., Phila., Pa.  
 Sidney Tool Co., The, Sidney, O. "Sidney."  
 Whitney, Baxter D. & Son, Winchenden, Mass.

**SHEARS, Hand and Foot**

- Acme Shear Co., Bridgeport, Conn. "Ajax."  
 Badger State Machine Co., Janesville, Wis. (Hand.)  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Hand.)  
 Bliss, E. W. Co., Adams St., Brooklyn, N. Y. (Foot.)  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo." (Hand.)

★ indicates Advertisers—see Index in back of book.

**SHEARS, Hand and Foot—Continued**

- Carlin's Sons, Thomas Co., 1600 River Ave., N. S., Pittsburg, Pa. (Hand, for cutting bar iron.)  
 Clauss Shear Co., Fremont, O. "Star."  
 Clough, R. M., Tolland, Conn. (Hand.)  
 Dudley Tool Co., Menominee, Mich.  
 Harvey, Arthur C. Co., 374 Congress St., Boston, Mass.  
 Heartley Machine, Variety Iron & Tool Works, 900-908 Summit St., Toledo, O.  
 Little Giant Punch & Shear Co., Sparta, Ill. "Little Giant."  
 Mitts & Merrill, Saginaw, Mich.  
 National Cutlery Co., Westmoreland & Boudinot Sts., Phila., Pa. "National." (Hand.)  
 Niagara Machine & Tool Works, Jefferson, Superior & Randall Sts., Buffalo, N. Y. "Niagara."  
 Peck, Stow & Wilcox Co., Southington, Conn. (Hand.)  
 Prentiss Tool & Supply Co., 116 Liberty St., N. Y. City.  
 Queen City Punch & Shear Co., 208-12 Lawrence St., Cincinnati, O.  
 Schatz Mfg. Co., The, Poughkeepsie, N. Y. "Schatz."  
 Stortz, John & Son, 210 Vine St., Phila., Pa. (Hand.)  
 Wiss, J. & Sons Co., Newark, N. J. (Hand.)

**SHEARS, Lever**

- Armstrong-Blum Mfg. Co., 339-57 N. Francisco Ave., Chicago, Ill. "Marvel."  
 Badger State Machine Co., Janesville, Wis.  
 ★Detroit Shear Co., 139 Beaubien St., Detroit, Mich. "Searight's."  
 Kidder, J. F. Mfg. Co., Burlington, Vt. "Little Blacksmith." (Also combined punches, shears & benders.)  
 Lansing Machine Co., Lansing, Mich.  
 Novelty Iron Works, Dubuque, Iowa. "Victor."  
 Peck, Stow & Wilcox Co., Southington, Conn.

**SHEARS, Power**

- American Can Co., Merchants' Loan & Trust Bldg., Chicago, Ill.  
 Badger State Machine Co., Janesville, Wis.  
 Bliss, E. W. Co., 17 Adams St., Brooklyn, N. Y.  
 Buffalo Forge Co., Buffalo, N. Y. "Buffalo."  
 Cincinnati Punch & Shear Co., Cincinnati, O.  
 Cleveland Punch & Shear Works, Cleveland, Ohio.  
 Erie Foundry Co., Erie, Pa.  
 Heartley Machine, Variety Iron & Tool Works, 900-908 Summit St., Toledo, O.  
 Hiles & Jones Co., Wilmington, Del.  
 Kane & Roach, Syracuse, N. Y.  
 Leiman Bros., 62 John St., N. Y. City.  
 Long & Allstatter Co., Hamilton, O.  
 Loy & Naurath Co., 21-29 Runyon St., Newark, N. J. (Also combined punches & shears.)  
 National Machinery Co., Tiffin, O.  
 New Doty Mfg. Co., Janesville, Wis.  
 Niagara Machine & Tools Works, Jefferson, Superior & Randolph Sts., Buffalo, N. Y. "Niagara."  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Peck, Stow & Wilcox Co., Southington, Conn.  
 Perkins Machine Co., Warren, Mass.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Queen City Punch & Shear Co., 208-12 Lawrence St., Cincinnati, O.  
 Royersford Foundry & Machine Co., Royersford, Pa.  
 Schatz Mfg. Co., The, Poughkeepsie, N. Y. "Schatz."  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
 Stoll, D. H. Co., 36 Lansing St., Buffalo, N. Y. (Squaring.)

- Toledo Machine & Tool Co., Toledo, Ohio. (Squaring.)  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. "Waterbury."  
 Whiting, Geo. Co., 1417 W. North Ave., Chicago, Ill.  
 Williams, White & Co., Moline, Ill.

**SHOVELS, Molders'**

- Pittsburg Shovel Co., Pittsburg, Pa.  
 Stevens, Frederic B., Detroit, Mich. "Ames," "Blair," "Wood," "Stuart" & "P. K."  
 Wood Shovel & Tool Co., Piqua, O. "Wood," "Staurt," "Wilson" & "Piqua."

**SLOTTERS**

- Betts Machine Co., Wilmington, Del.  
 Cooks, Asa S. Co., 80 Huyshope Ave., Hartford, Conn.  
 Davis Sewing Machine Co., Dayton, Ohio. "Davis."  
 Dill, T. C. Machine Co., Inc., Somerset, Massachusetts & Mutter Sts., Phila., Pa.  
 Garvin Machine Co., Spring & Varrick Sts., N. Y. City.  
 Grant Mfg. & Machine Co., The, 90 Silliman Ave., Bridgeport, Conn. "Grant."  
 Hubbell, Harvey, Inc., Bridgeport, Conn. "Hubbell."  
 Manville, E. J. Machine Co., Waterbury, Conn. (Screw.)  
 National-Acme Mfg. Co., The, Cleveland, O. "Acme" (Semi-automatic screw.)  
 New Haven Mfg. Co., New Haven, Conn.  
 Newton Machine Tool Works, 24th & Vine Sts., Phila., Pa. (Portable.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.  
 Simonds File Co., Fitchburg, Mass. "Simonds."  
 Union Twist Drill Co., Athol, Mass.

**SODA & POTASH KETTLES**

- Brown & Sharpe Mfg. Co., Providence, R. I.  
 Gray & Prior Machine Co., The, 90 Suffield St., Hartford, Conn.  
 Manufacturing Equipment & Engineering Co., 209 Washington St., Boston, Mass.

**SPANNERS**

- Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y. "Forsyth." (Cone.)  
 Roren Drop Forge Co., Providence, R. I.

**SPARK PLUG BRUSHES**

- American Wire Brush Co., 277 Greenwich St., N. Y. City.  
 Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O. "Osborn."

**SPIRIT LEVELS**

- Athol Machine Co., Athol, Mass.  
 Davis & Cook, Watertown, N. Y.  
 Goodell-Pratt Co., Greenfield, Mass.  
 Keuffel & Esser Co., 127 Fulton St., N. Y. City.  
 Smith, E. G. & Co., Columbia, Pa. "Which Way."  
 Stratton Level Co., Greenfield, Mass.

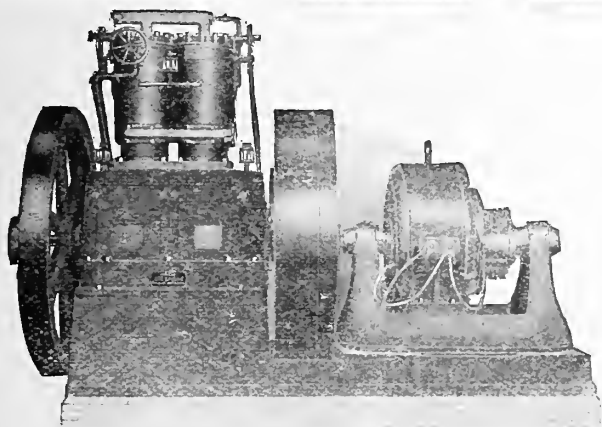
**STANDS**

Skinner Chuck Co., New Britain, Conn.  
(Reamer or assembling.)

**STATIONARY ENGINES**

- Ajax Iron Works, Corry, Pa. (Gas and gasoline.)  
Alamo Mfg. Co., The, Hillsdale, Mich.  
"Alamo" & "Victor." (Gas, gasoline, distillate, kerosene & alcohol.)  
American Oil Engine Co., 1779 Broadway, N. Y. City. "American." (Oil, also portable.)  
Anderson Engine Co., Shelbyville, Ill. (Gas & gasoline.)  
★Anderson Motor Co., The, 16th & Jackson Sts., Anderson, Ind. (Gasoline, also portable.)  
Angola Engine & Foundry Co., Angola, Ind. "Angola." (Gas & gasoline.)  
Atmogen Machine Works, Westminster Station, Vt. "Atmogen." (Gas & gasoline & portable.)  
★Aurora Automatic Machine Co., 1307 Michigan Ave., Chicago, Ill. "Thor." (Gasoline.)  
Automatic Machine Co., The, Bridgeport, Conn. "Automatic." (Gasoline.)  
★Beilfuss Motor Co., The, cor. Saginaw St. & M. C. R. R. Co., Lansing, Mich. "Beilfuss."  
Bessemer Gas Engine Co., The, Grove City, Pa. "Bessemer." (Gas.)  
Bovaird & Co., Bradford, Pa. "Bovaird." (Gas & gasoline.)  
★Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y. "Brennan." (Gasoline.)  
Brill Engine Works, Appleton, Wis. "Brill."  
Buckeye Engine Co., Salem, O. "Buckeye." (Gas & steam.)  
Callahan, The W. P. Co., 909 E. Third St., Dayton, O. (Gas & gasoline.)  
Camden Anchor-Rockland Machine Co., Camden, Me. "Knox." (Gas & gasoline.)  
Capital Gas Engine Co., West 21st St. & The Belt Railway, Indianapolis, Ind. "Gem" & "Capital." (Gas & gasoline.)  
Champaign Bros., Ithaca, N. Y.  
Chapman Engine Works, Marcellus, Mich. "Economizer." (Using mixture of gasoline & kerosene.)  
Charter Gas Engine Co., Sterling, Ill. "Charter" & "Sterling." (Gas, gasoline, alcohol, distillate kerosene & naphtha.)  
Christensen Engineering Co., 841-47 30th St., Milwaukee, Wis. "Badger." (Gas & gasoline.)  
Consolidated Carpet Sewing Machine Co., The, Bridgeport, Conn. "Fairfield," "Park City" & "Bull Pup." (Gasoline.)  
Continental Motor Mfg. Co., Muskegon, Mich. (Gasoline.)  
Cooley Mfg. Co., Waterbury, Vt. (Gasoline stationary & portable.)  
Cushman Motor Works, 2020-2030 N St., Lincoln, Neb. (Gasoline.)  
Dean Mfg. Co., South Cincinnati, Newport, Ky. "Dean." (Gas.)  
DeMooy Bros., Cleveland, O. (Gasoline.)  
Detroit Auto Specialty Co., 909-911 Greenwood Ave., Detroit, Mich. (Gasoline.)  
Du Bois Iron Works, Du Bois, Pa. (Gas & gasoline.)  
★Duryea, Chas. E., Reading, Pa. "Inductio."  
Elbridge Engine Co., Culver Road, Rochester, N. Y. "Gem" & "Standard." (Gasoline.)  
Eagle Automobile Mfg. Co., The, Appleton, Wis. (Gasoline.)  
Economic Engine Works, 3 Fulton St., Utica, N. Y. (Gasoline.)  
Enterprise Machine Co., 1114-22 S. 3rd St., Minneapolis, Minn. "Westman."  
Evarts Machine Co., The, 18 Hicks St., Hartford, Conn. (Gas & gasoline.)  
Fairbanks-Morse & Co., Chicago, Ill. "Fairbanks-Morse" & "Jack of all Trades." (Gasoline, gas, kerosene, alcohol, distillate naphtha, producer gas & crude oil.)

# NASH GAS ENGINES



**The Nash Vertical Stationary Engine**  
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It operates on City Gas, Gasoline, Distillate and Producer Gas.

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LOS ANGELES

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**STATIONARY ENGINES—Continued**

- Foos Gas Engine Co., The, Springfield, Ohio.  
 "Foos." (Gas & gasoline, also portable engines.)  
 Frisbie-Heft Motor Co., Middletown, Conn.  
 "Frisbie." (Gasoline.)  
 Gade Bros. Mfg. Co., Iowa Falls, Iowa. (Gas & gasoline.) "Gade."  
 Gardner Motor Co., The, 5143 Delmar Blvd., St. Louis, Mo. "Gardner." (Gasoline.)  
 General Mfg. Co., Elkhart, Ind. (Gasoline.)  
 Hall Gas Engine Mfg. Co., Byesville, Ohio. "Hall."  
 Hartig Standard Gas Engine Co., 14 Commercial St., Newark, N. J. (Gas & gasoline.)  
 Heath, W. A. Machine Co., Inc., Lestershire, N. Y. (Gasoline.)  
 Heer Engine Co., The, Portsmouth, Ohio. (Gas & gasoline.)  
 Holliday Engineering Co., 749 Bunker St., Chicago, Ill. "Holliday." (Gas, gasoline & alcohol.)  
 Holm's Machine Mfg. Co., Sparta, Mich. "Economy." (Gasoline.)  
 Horton Boat, Engine & Supply Co., 90 South Ave., Rochester, N. Y. (Gasoline.)  
 Huntsville Foundry & Machine Works, Huntsville, Mass. "Jones." (Gas & gasoline.)  
 Huron Steel & Iron Co., The, Norwalk, Ohio. "Davis." (Gas & gasoline.)  
 Ideal Mfg. Co., Portsmouth, Ohio. (Gasoline.)  
 Industrial Iron Works, The, Clinton, Mo. (Gasoline.)  
 International Harvester Co. of America, 7 Monroe St., Chicago, Ill. "I. H. C." (Gasoline.)  
 Jacobson Machine Mfg. Co., Warren, Pa. "Mascot." (Gasoline.)  
 Jones, Major Motor Co., 74 Sproat St., Detroit, Mich. "Major Jones." (Gasoline & gas.)  
 Kansas City Hay Press Co., Kansas City, Mo. "Lightning" & "K. C. Junior." (Gas & gasoline.)  
 Kenton Gas Engine Co., The, Kenton, Ohio. (Gas & gasoline.)  
 Kneeland Mfg. Co., Lansing, Mich. "Kneeland." (Gasoline.)  
 Lackawanna Mfg. Co., Newburgh, N. Y. "Lackawanna Valveless." (Gasoline.)  
 Lambert Gas & Gasoline Engine Co., Anderson, Ind. "Lambert." (Gas & gasoline.)  
 Lansing Machine Co., Lansing, Mich. (Gasoline.)  
 Lauson, The John Mfg. Co., New Holstein, Wis. "Lauson" & "Frost King." (Gas & gasoline.)  
 Lauson-Lawton Co., The, De Pere, Wis. "Wisconsin." (Gas & gasoline.)  
 Loew Mfg. Co., The, Cleveland, O. "Loew Victor." (Gasoline.)  
 Mason, Wm. H., Mt. Carmel, Ill. "Mason." (Gasoline.)  
 Maxwell & Fitch Co., Rome, N. Y. (Gas & gasoline.)  
 Michigan Steel Boat Co., The, 1250-1500 Jefferson Ave., Detroit, Mich. "Detroit." (Gasoline & kerosene.)  
 Middletown Machine Co., The, Middletown, Ohio. "Miami" & "Woodpecker." (Gas & gasoline.)  
 ★Model Gas Engine Works, Peru, Ind. (Gasoline, natural gas & suction gas.)  
 ★Monarch Motor Mfg. Co., 3146 N. Halsted St., Chicago, Ill. "Monarch." (Engines for lighting outfits.)  
 National Engineering Co., Saginaw, Mich. "New Model" & "Michigan." (Gas & gasoline.)  
 ★National Meter Co., 84-86 Chambers St., N. Y. City. "Nash." (Gas & gasoline.)  
 New Holland Machine Co., New Holland, Pa. "New Holland." (Gasoline; also portable.)  
 New London Motor Co., The, New London, Conn. "Pequot." (Gasoline.)  
 "New Way" Motor Co., The, Lansing, Mich. (Gas, gasoline, alcohol & distillate.)  
 Nichols Power Co., Stamford, Conn. "Nichols." (Kerosene.)  
 Odee & Koto Machine Co., 642 Race St., Beloit, Wis. "Odee." (Gas.)  
 Olin Gas Engine Co., 10-16 Lock St., Buffalo, N. Y.  
 Ontario Iron Works, Pulaski, N. Y. "Safe." (Steam.)  
 ★Otto Gas Engine Works, The, 33rd & Walnut Sts., Phila., Pa. "Otto." (Gasoline & gas.)  
 Page Engineering Co., 113-121 E. York St., Baltimore, Md. ("Page," gasoline; "Straub" gasoline, distillate & producer gas.)  
 Palmer Bros., Cos Cob, Conn. (Gasoline.)  
 Peerless Motor Co., Lansing, Mich. (Gasoline.)  
 Plunket, J. E., 1342 W. Lake St., Chicago, Ill. "Plunket, Jr." (Gas & gasoline.)  
 Practical Gas Engine & Machine Works, North Chicago, Ill. (Gasoline.)  
 Racine Engine & Machinery Co., Racine, Wis. "The Racine." (Steam.)  
 Reliance Iron & Engine Co., Racine, Wis. "Sta-Rite." (Gas & gasoline.)  
 Remington Oil Engine Co., The, 700 Pacific St., Stamford, Conn. "Remington." (Kerosene.)  
 Reynolds Motor Co., 35 Equity Bldg., Detroit, Mich. (Gas & gasoline.)  
 Root & Van Dervoort Engineering Co., The, East Moline, Ill. "R. & V." (gas, gasoline, alcohol & distillate.)  
 Ryan, W. M. Co., 314 S. Canal St., Chicago, Ill. "Shortt."  
 St. Marys Machine Co., St. Marys, Ohio. "St. Marys." (Gas & gasoline.)  
 Seager Engine Works, 954 Chestnut St., Lansing, Mich. "Olds." (Gasoline, gas, kerosene & producer gas.)  
 Sherman & Smith Mfg. Co., Independence, Ia. "Sherman & Smith." (Gasoline.)  
 Sintz, Guy L. Co., Marshall, Mich. "Sintz." (Gasoline.)  
 Standard Pattern & Mfg. Co., The, Richmond, Ind. "Richmond Standard." (Gas & gasoline.)  
 Star Mfg. Co., The, New Lexington, Ohio. "Star." (Gas & gasoline.)  
 Stickney, Chas. A. Co., St. Paul, Minn. "Stickney." (Gasoline; also portable.)  
 Strang Engine Co., Harvey, Ill. "Strang." (Gas, gasoline & kerosene.)  
 Strelinger Marine Engine Co., 171-175 Woodbridge St., W., Detroit, Mich. "Little Giant." (Gasoline.)  
 Temple Pump Co., The, 17-27 West 15th St., Chicago, Ill. "Master Workman," "Temple" & "Wizard." (Gasoline.)  
 Terry Engine Co., Bay, 43rd & 44th Sts., Ulmer Park, Brooklyn, N. Y. "Terry." (Gas, gasoline, kerosene, distillate & alcohol.)  
 1,000 Island Boat & Engine Co., Morristown, N. Y. "Lloyd." (Gasoline.)  
 Trebert Gas Engine Co., Butler, Ind. (Gasoline.)  
 United States Engine Works, The, 715 S. Main St., Oshkosh, Wis. (Gasoline.)  
 Walnwright, W. W. & Son, 16th St. & Western Ave., Connersville, Ind. (Gas & gasoline.)  
 Waterman Marine Motor Co., 1506-12 Fort St., W., Detroit, Mich. "Waterman." (Gas & gasoline.)  
 ★Waukesha Motor Co., Waukesha, Wis. "Waukesha." (Gasoline.)  
 Weber Gas Engine Co., Kansas City, Mo. "Weber." (Gas, gasoline, distillate, kerosene & producer gas.)  
 Williamsport Gas Engine Works, Foot of Walnut St., Williamsport, Pa. "Williamsport." (Gas & gasoline.)  
 Wright, L. Machine Works, 9-15 Alling St., Newark, N. J. (Steam & gasoline.)

**STEAM HAMMERS**

(See Hammers, Steam, Drop &amp; Power.)

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## SURFACE GRINDERS

- ★American Die & Tool Co., Reading, Pa.  
Bath Grinder Co., 67 Walnut St., Fitchburg, Mass.
- ★Bennett-O'Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill.
- Binsse Machine Co., The, Newark, N. J.
- Diamond Machine Co., Providence, R. I.  
"Diamond."
- ★Heald Machine Co., The, 14 New Bond St., Worcester, Mass. "Heald."
- Miami Valley Machine Tool Co., Dayton, O.  
"Dayton."
- National Machine Co., The, Hartford, Conn.
- ★Pratt & Whitney Co., 111 Broadway, N. Y. City. (Vertical.)
- Ransom Mfg. Co., Oshkosh, Wis.
- Robinson Tool Works, Waterbury, Conn.  
"Robinson."
- Rowbottom Machine Co., The, Waterbury, Conn. (Combination disc and surface grinders.)
- Springfield Mfg. Co., Bridgeport, Conn.
- Stein, Wm. P. & Co., 282 State St., Rochester, N. Y. "Stein."
- Tanite Co., The, Stroudsburg, Pa. "Tanite."
- Walker, O. S. & Co., 25 Union St., Worcester, Mass. "One Stroke" & "Flat."
- Wilmarth & Morman Co., 583 Canal St., Grand Rapids, Mich. "New Yankee."

## SUPPORTS, Car

(See Car Supports.)

## SWAGE BLOCKS

- Fisher & Norris, Trenton, N. J.
- Huntsville Foundry & Machine Works, Huntsville, Ala.
- Noyes, B. B. Co., Greenfield, Mass. "Little Giant."
- Swett, A. L. Iron Works, Medina, N. Y.

## SWING SAWS

- American Sawmill Machinery Co., Hacketts-town, N. J. "American."
- Baldwin, Tuthill & Bolton, Grand Rapids, Mich.
- Bentel & Margendant Co., The, Hamilton, O.  
"Hamilton."
- Colladay, Jas. O. Co., 624-26 Race St., Phila., Pa.
- Connell & Dengler Machine Co., 254 Mill St., Rochester, N. Y.
- Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin."
- Crescent Machine Co., Leetonia, Ohio. "Crescent."
- Fox Machine Co., 327 Front St., Grand Rapids, Mich.
- Huntsville Foundry & Machine Works, Huntsville, Ala.
- Lovell Machine Works, Gardner, Mass.
- ★Oliver Machinery Co., Grand Rapids, Mich.
- Porter, C. O. Machinery Co., Grand Rapids, Mich.
- Root, B. M. Co., York, Pa.
- Sidney Tool Co., The, Sidney, O. "Sidney."
- Silver Mfg. Co., Salem, O. "Salem."
- Smith, H. B. Machine Co., Smithville, N. J.
- Standard Saw Mill Machinery Co., Erie, Pa.
- U. S. Machine Co., Williamsport, Pa.
- West Side Iron Works, 31-33 S. Front St., Grand Rapids, Mich.
- White, John A. Co., Dover, N. H.
- Yerkes & Finlan Woodworking Machine Co., St. Louis, Mo.

## SWITCHES, Electric

- Ideal Machine Works, 255-257 39th St., Brooklyn, N. Y. "Cookson's Security." (Electric.)

## TACHOMETERS

- Schuchardt & Schutte, 90 West St., N. Y. City.
- Woodman, R. Mfg. & Supply Co., Boston, Mass.

## TAP EXTRACTORS

- Graham Mfg. Co., Providence, R. I.
- Walton Co., The, 306 Pearl St., Hartford, Conn. "Walton."

## TAPPING MACHINES

- Automatic Machine Co., Bridgeport, Conn. (Horizontal nut tappers.)
- Baker Bros., Toledo, O.
- Evans Stamping & Plating Co., Cushman St., Taunton, Mass.
- Fulton Foundry & Machine Co., 21 Furman St., Brooklyn, N. Y. "Fulton." (Sensitive.)
- Garvin Machine Co., Spring & Varrick Sts., N. Y. City.
- Grant Mfg. & Machine Co., 90 Silliman Ave., Bridgeport, Conn. "Grant."
- Howard Iron Works, Buffalo, N. Y. "Schlenker." (Nut.)
- Hubbell, Harvey, Inc., Bridgeport, Conn. "Hubbell."
- Landis Machine Co., Waynesboro, Pa. (Nut.)
- National Machine Co., The, Hartford, Conn.
- Niles-Bement-Pond Co., 111 Broadway, N. Y. City.
- Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.
- Quint, A. D., 8 Clinton St., Hartford, Conn. (Turret.)
- Reed, Francis Co., 43 Hammond St., Worcester, Mass. (Nut.)
- St. Louis Machine Tool Co., 1405 S. 7th St., St. Louis, Mo. "St. Louis."
- Webster & Perks Tool Co., Springfield, O.
- Wells, F. E. & Son Co., Greenfield, Conn. "Wells."

## TAPS & DIES

- ★American Die & Tool Co., Reading, Pa. (Dies.)
- American Tap & Die Co., Greenfield, Mass.
- "Eagle" & "American." (Also "Adamantine" screw plates & die stocks.)
- Armstrong Mfg. Co., 295 Knowlton St., Bridgeport, Conn. "Armstrong." (Pipe taps, stocks & dies.)
- Bay State Tap & Die Co., Mansfield, Mass. "Bay State." (Also screw plates.)
- ★Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill. "Helmet Temper." (Taps.)
- Boker, Herman & Co., 101 Duane St., New York, N. Y. (Taps.)
- Borden Co., The, Warren, Ohio. "Beaver." (Stocks & dies.)
- Braunsdorf-Mueller Co., Elizabeth, N. J. (Die stocks.)
- Brown, The H. B. Co., East Hampton, Conn.
- Brubaker, W. L. & Bros., Millersburg, Pa. (Also screw plates.)
- Butterfield & Co., Derby Line, Vt. "Butterfield," "Derby" & "Reece." (Also screw plates & pipe stocks.)
- Card, S. W. Mfg. Co., Mansfield, Mass.
- Carpenter, The J. M. Tap & Die Co., Pawtucket, R. I. (Also screw plates & die stocks.)
- Champion Blower & Forge Co., Lancaster, Pa. "Easy" & "Electric." (Also screw plates, collets, etc.)
- Cleveland Twist Drill Co., Cleveland, Ohio. (Taps.)

★ indicates Advertisers—see Index in back of book.

**TAPS & DIES—Continued**

- Conant & Donelson, Greenfield, Mass. "Reliable." (Also die stocks & screw plates.)  
 Curtis & Curtis Co., Bridgeport, Conn. "Forbes." (Patent die stock.)  
 Errington, F. A., 39 Cortlandt St., N. Y. City. "Errington." (Die heads.)  
 Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. "Geometric." (Adjustable collapsing taps & screw cutting die heads.)  
 Hart Mfg. Co., The, 1362 E. 3rd St., N. E., Cleveland, O. ("Buckeye" dies & stocks, "Duplex" screw plates.)  
 Hollands Mfg. Co., Erie, Pa. (Pipe taps.)  
 Holroyd & Co., Waterford, N. Y. "H. & Co." (Also die stocks & screw plates.)  
 Hoopes & Townsend Co., 1330 Buttonwood St., Phila., Pa.  
 Ideal Opening Die Co., 24-27 West St., N. Y. City. (Dies.)  
 Jones & Lamson Machine Co., Springfield, Vt. "Hartness." (Automatic dies.)  
 Knight Machinery Co., W. B., 2019 Lucas Ave., St. Louis, Mo. (Dies.)  
 Landis Machine Co., Waynesboro, Pa. (Dies & die heads.)  
 Lowell Wrench Co., 100 Exchange St., Worcester, Mass. (Ratchet die stocks.)  
 Modern Tool Co., Erie, Pa. (Dies.)  
 Morse Twist Drill & Machine Co., New Bedford, Mass. (Also screw plates.)  
 National Stamping & Electric Works, 153-59 S. Jefferson St., Chicago, Ill. (Dies.)  
 Nicholson, W. H. & Co., Wilkes-Barre, Pa. "Nicholson." (Taps.)  
 Noonon Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y. "Noonan's." (Tire valve re-threading tool.)  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.  
 Reece, E. F. Co., Greenfield, Mass. ("Reece" screw plates, stocks & dies, "Hercules" taps, also special for spark plugs.)  
 Reed Mfg. Co., Erie, Pa. (Dies & stocks.)  
 Reed & Prince Mfg. Co., Duncan Ave., Worcester, Mass.  
 Remington Tool & Machine Co., 50 Congress St., Boston, Mass. (Adjustable threading dies.)  
 Standard Tool Co., Cleveland, O. (Taps.)  
 Stein, Wm. P. & Co., 232 State St., Rochester, N. Y. (Dies.)  
 Stimpson, Edwin B. Co., 31 Spruce St., N. Y. City. (Dies.)  
 Victor Tool Co., Waynesboro, Pa. (Collapsible taps.)  
 Wade Machine Co., 287 Atlantic Ave., Boston, Mass. (Dies.)  
 Walworth Mfg. Co., 128 Federal St., Boston, Mass. "Walworth." (Also die plates.)  
 Webster & Perks Tool Co., Springfield, Ohio. (Dies.)  
 Wells Bros. Co., Greenfield, Mass. "Little Giant." (Also screw plates, die heads, stocks, etc.)  
 Wells, F. E. & Son Co., Greenfield, Mass. "Economy." (Stocks & dies.)  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "National." (Taps & screw plates.)  
 Wiley & Russell Mfg. Co., Greenfield, Mass. "Lightning" & "Green River." (Also screw plates.)  
 Winter Bros. Co., Wrentham, Mass. "This-tle." (Also die stocks.)

**TEMPERING COMPOUNDS**

Mosso, C. A., Chicago, Ill. "Mosso's Mon-arch."

**TEMPERING FURNACES**

(See Annealing & Case Hardening Furnaces.)

**TENONERS**

- American Wood Working Machinery Co., Rochester, N. Y.  
 Bentel & Margendant Co., The, Hamilton, O. "Hamilton."  
 Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin."  
 Hall & Brown Wood-Working Machine Co., 1913-29 N. Broadway, St. Louis, Mo.  
 ★Niagara Machine Co., 825-27 Linwood Ave., Niagara Falls, N. Y. "Ellingwood."  
 ★Oliver Machinery Co., Grand Rapids, Mich.  
 Pettingill Machine Co., The, 79 Elm St., Amesbury, Mass.  
 Power, L. & Co., Phila., Pa.  
 Smith, H. B. Machine Co., Smithville, N. J.  
 Yerkes & Finan Woodworking Machine Co., St. Louis, Mo.

**TESTERS, For Testing Hardness of Metals**

- ★Shore Instrument & Mfg. Co., 555-57 W. 22nd St., N. Y. City. "Scleroscope."

**THERMOMETERS**

- ★Randall-Faichney Co., 251 Causeway St., Boston, Mass. (Vulcanizing.)

**THREADING TOOLS**

- American Tap & Die Co., Greenfield, Mass. "Eagle" & "American."  
 Borden Co., The, Warren, O. (Pipe.)  
 Hart Mfg. Co., 1362 E. 3rd St., N. E., Cleveland, O. "Duplex."  
 Modern Tool Co., Erie, Pa.  
 Rivett Lathe Mfg. Co., Brighton, Boston, Mass.  
 Rogers, John M. Works, Gloucester City, N. J.  
 Toledo Pipe Threading Machine Co., Toledo, Ohio. "Toledo."

**TIRE WHEELS, Graduated**

Wells Bros. Co., Greenfield, Mass.

**TONGS**

- ★Buffum Tool Co., Louisiana, Mo. "Swastika." (Die makers.)  
 Byram & Co., Inc., Detroit, Mich. (Crucible.)  
 Leiman Bros., 62 John St., N. Y. City. (Crucible.)  
 Moore Drop Forging Co., Brightwood, Springfield, Mass. (Blacksmith.)

**TOOLS, Machinery**

- Almond, T. R. Mfg. Co., Ashburnham, Mass. "Almond." (Turret head tools.)  
 ★American Die & Tool Co., Reading, Pa.  
 ★American Tool Works Co., The, 6th & Eggleston Ave., Cincinnati, O.  
 Armstrong Bros. Tool Co., Chicago, Ill. (Planer, boring & lathe tools.)  
 Bardons & Oliver, Cleveland, Ohio. (Lathe tools.)  
 Bay State Stamping Co., 380 Chandler St., Worcester, Mass. "Bennett." (Trueing tools.)  
 Betts Machine Co., Wilmington, Del. (Metal working machine tools.)  
 Boker, Herman & Co., 101 Duane St., N. Y. City. (Special tools.)  
 Cincinnati Planer Co., Cincinnati, O.

**TOOLS, Machinery—Continued**

- Dwight Slate Machine Co., Hartford, Conn. (Cutting-off tools.)  
 Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. "Geometric." (Milling tools.)  
 Hill Standard Mfg. Co., Anderson, Ind. "Hill." (Lathe, planer & drill press tools.)  
 ★Krieger, Tool & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill. "Krieger's." (Drill press, turret & lathe bars, thread chasers & roughing tools.)  
 ★Long Arm System Co., E. 38th St. & Lakeside Ave., Cleveland, O. (Automatic tooth chamfering attachments.)  
 Marcy Tool Works, Putnam, Conn. (Lathe, planer & shaper.)  
 Mingst, C. P., 1230 Riverside Ave., Evansville, Ind. "Mingst." (Boring, cutting off & turning tools.)  
 Modern Tool Co., Erle, Pa. (Hollow milling tools.)  
 National File & Tool Co., The, 2110 Allegheny Ave., Phila., Pa. "Vixen." (Milling tools.)  
 O. K. Tool Holder Co., Shelton, Conn. "O. K." (Lathe, shaper, planer & boring mill tools.)  
 Pugh, Owen J., 26 Washington St., Buffalo, N. Y. (Screw machine tools.)  
 South Bend Machine Tool Co., South Bend, Ind. (Lathe tools.)  
 Stortz, John & Son, 210 Vine St., Phila., Pa. (Lathe & planer tools.)  
 Thompson, Henry G. & Son Co., New Haven, Conn. "Carr." (Lathe & planer tools.)  
 Union Twist Drill Co., Athol, Mass. (Hobs.)  
 Warner & Swasey Co., Cleveland, O. (Tools for lathes.)  
 Wells Bros. Co., Greenfield, Mass. (Milling tools.)

**TOOLS, Miscellaneous**

- Adjustable Collet Co., The, 211 High Ave., Cleveland, O. (Special.)  
 Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
 Allen, L. B. Co., 1353 Columbia Ave., Chicago, Ill. "Allen." (Soldering sets.)  
 American File Sharpener Co., 287 Broadway, N. Y. City. "A. F. S. Co."  
 Atkins, E. C. & Co., Indianapolis, Ind. "AAA." (Saw tools.)  
 Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.  
 Baker Bros., Toledo, O. (Pattern shop.)  
 Baldwin, Tuthill & Bolton, Grand Rapids, Mich. (Saw sharpeners, swages & saw tools.)  
 Barnett, Oscar Foundry Co., Newark, N. J. (Moulders' tools.)  
 Bay State Tap & Die Co., Mansfield, Mass. "Bay State." (Countersinks & chasers.)  
 Blair Tool & Machine Works, 24-27 West St., N. Y. City. (Special.)  
 Blount, G. J. Co., Everett, Mass. (Pattern shop.)  
 Boston Auto Gage Co., 8 Waltham St., Boston, Mass. "Triumph." (Tank cutters.)  
 Bridgeport Hardware Mfg. Corp., Bridgeport, Conn. (Wire cutters.)  
 Brown & Sharpe Mfg. Co., Providence, R. I. (Rammers.)  
 Buck Bros., Millbury, Mass. (Countersinks & gauges for wood.)  
 ★Buffum Tool Co., Louisiana, Mo. (Tool sets.)  
 Carpenter, Geo. B. & Co., 202-208 South Water St., Chicago, Ill.  
 Chandler Co., The, Inc., 31 Taylor St., Springfield, Mass. (Steel stamps, letters & figures.)  
 Chapin-Stevens Co., Pine Meadow, Conn. (Spoke shaves.)  
 Chicago Pneumatic Tool Co., Chicago, Ill. (Hose clamp tools.)  
 Cincinnati Tool Co., Norwood, Ohio. "Hargraves." (Countersinks; spoke shaves.)  
 Clark, James, Jr., Electric Co., 520 W. Main

**Troubles of Manufacturers**

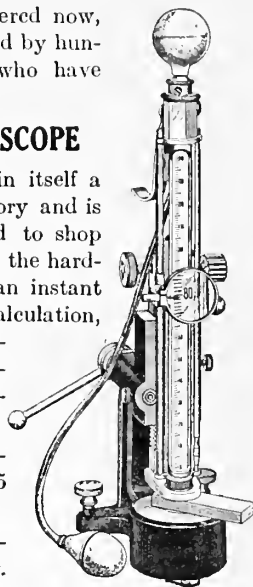
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 Clough, R. M., Tolland, Conn. (Counterbores.)  
 Consolidated Press & Tool Co., Hastings, Mich.  
 Crescent Machine Co., The, Leetonia, Ohio. "Crescent." (Knife grinding gauges.)  
 ★Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich. "Presteel." (Special.)  
 Detroit Twist Drill Co., 634-46 Fort St., W., Detroit, Mich. (Special.)  
 Deuse, J. S., Chester, Conn. (Countersinks.)  
 Dobson, Wm., Canastota, N. Y. "Dobson." (Moulders' tools.)  
 Ducasse, Henry & Co., 735 Seventh Ave., N. Y. City. "Universal." (Combination forge, anvil, drilling machine, vise, bench, mill, pipe jaw & blowpipe.)  
 Dudley Tool Co., Menominee, Mich. (Nail pullers.)  
 Edge, Frank & Co., 31 & 33 S. Front St., Grand Rapids, Mich. (Band saw tools.)  
 Elgin Tool Works, The, Elgin, Ill.  
 Elmore Tool Mfg. Co., The, Hartford, Conn. "Elmore." (Drop forge.)  
 Estep & Dolan, Sandwich, Ill. (Angle benders & eye benders.)  
 Evansville Tool Works, Evansville, Ind. "E. T. W." (Fullers & swages.)  
 Forsyth Mfg. Co., 308-14 Terrace, Buffalo, N. Y. (Dies & tools to order.)  
 Fort Dearborn Mfg. Co., 1574-80 Crossing St., Chicago, Ill. (Special.)  
 Gabel-Hill Co., The, 121-125 Alexander St., Rochester, N. Y. (Auto.)  
 Gasket Supply Co., The, 1729 Ludlow St., Phila., Pa. (Embossing.)  
 Geier, The P. A. Co., 5112 St. Clair Ave., Cleveland, O. (Special.)  
 Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. "Geometric." (Special tools.)

**TOOLS, Miscellaneous—Continued**

- Heartley Machine, Variety Iron & Tool Works, 900-908 Summit St., Toledo, O. (Metal wheel making tools.)
- Illinois Iron & Bolt Co., Carpentersville, Ill. (Fullers & swages.)
- Kemp Smith Mfg. Co., Milwaukee, Wis. "Kemp Smith."
- Klein-Logan Co., Pittsburg, Pa. (Fullers & swages.)
- Knight, W. B. Machinery Co., 2019 Lucas Ave., St. Louis, Mo.
- Law, F. A. Machine Co., 41 Wells St., Hartford, Conn.
- McCabe, J. J., 30 Church St., N. Y. City. (Machinists' supplies.)
- Macomber & Whyte Rope Co., 507-9 S. Clinton St., Chicago, Ill. "Ritter." (Spring winders.)
- Marbach, The F. G. Co., Medina, O. (Concave & convex gauges.)
- Marcy Tool Works, Putnam, Conn. (Special, to order.)
- Mayer, Charles W. Co., 10 Furnace St., Rochester, N. Y. (Special tools.)
- Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill. (To order.)
- Millers Falls Co., 28 Warren St., N. Y. City. (Spoke shaves.)
- Morse Twist Drill & Machine Co., New Bedford, Mass., (Countersinks & counterbores.)
- Murdock, The James, Jr., Co., 112 Opera Place, Cincinnati, O. (Steel stamps.)
- National Stamping & Electric Works, 153-59 S. Jefferson St., Chicago, Ill.
- National Tool Co., Cleveland, Ohio. (Special tools.)
- National Twist Drill & Tool Co., Detroit, Mich. (Special tools.)
- Ness, Geo. M., Jr., N. Y. City. (Steel stamps.)
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y. "Noonan's." (Crank swages, hand forged tools, inner tube testers, inner tube removers, soft face vise jaws, crank removers.)
- No-Shammy Co., The, 5710 Hough Ave., N. E., Cleveland, O. "No-Shammy." (Device for flaring out gasoline pipings.)
- Ohio Tool Co., Columbus, Ohio. (Spoke shaves.)
- Osborn, The J. M. & L. A. Co., Cleveland, O. (Sheet metal working.)
- Pederson Mfg. Co., 636-644 First Ave., N. Y. City. "Red Pump." (Special.)
- Peninsular Tool & Specialty Co., Detroit, Mich. (Moulders' tools.)
- Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.
- ★Pratt & Whitney Co., 111 Broadway, N. Y. City.
- Reece, E. F. Co., Greenfield, Mass. "Hercules." (Counterbores & countersinks.)
- Reinke & Shirray Mfg. Co., 445-453 Lafayette Blvd., Detroit, Mich.
- Remington Tool & Machine Co., 50 Congress St., Boston, Mass. (Twist drill grinding gauges & "Perfection" spring winder.)
- Robbins, John Mfg. Co., 58 Kneeland St., Boston, Mass. (Steel stamps.)
- Rogers, John M. Works, Gloucester City, N. J. (Hardening steel mandrels, standard measuring machines.)
- Roren Drop Forge Co., Providence, R. I. (To order.)
- S. P. O. Automobile Co., 1595 Broadway, N. Y. City. (Imported.)
- Sackmann Mfg. Co., Akron, O. (Steel stamps.)
- Sawyer Tool Mfg. Co., Fitchburg, Mass. "Sawyer." (Machinists' small tools.)
- Schulz, Fritz H. A., 218-230 N. Jefferson St., Chicago, Ill. "Schulz." (Spinning.)
- Schridde, Wm., 35 S. Clark St., Chicago, Ill. (Steel stamps.)
- Schwerdtle Stamp Co., 39 & 41 Cannon St., Bridgeport, Conn. (Steel stamps.)
- Shigley, C. C., Grand Rapids, Mich. (Carburetor adjusting tools.)
- Standard Engineering Works, Ellwood City, Pa. (Special, to order.)
- Starrett, L. S. Co., Athol, Mass. (Machinists' tools.)
- Stein, Wm. P. & Co., 282 State St., Rochester, N. Y.
- Taft-Peirce Manufacturing Co., The, Woonsocket, R. I.
- Taylor & Fenn Co., Hartford, Conn.
- Taylor-Shantz Co., 230 Mill St., Rochester, N. Y.
- Toledo Machine & Tool Co., The, Toledo, O.
- Tuck Mfg. Co., 74 Ames St., Brockton, Mass. "Tuck." (Countersinks.)
- Turner Machine Co., Danbury, Conn.
- Uebelmesser, Chas. R. Co., Inc., Bayside, L. I., N. Y. (Striping & stencil wheel.)
- Valve Seating Tool Co., Bridgeport, Conn. "Pioneer." (Buffing tools.)
- Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn. "Vanderbeek." (Scraping tools.)
- Vaughan & Bushnell Mfg. Co., Chicago, Ill. "H. B." (Fullers & swages.)
- Wade Machine Co., 287 Atlantic Ave., Boston, Mass. (To order.)
- Walworth Mfg. Co., 128 Federal St., Boston, Mass. "Miller." (Ratchet tools.)
- ★Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis. "Warner." (Cut meter.)
- Waterloo Drop Forge Co., Falls Ave. & Orr St., Waterloo, Iowa.
- Weidner, C. A. & Co., 222 Mill St., Rochester, N. Y. (Special.)
- Wells Bros. Co., Greenfield, Mass. "Little Giant." (Countersinks.)
- Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "Eagle."
- White, L. & I. J. Co., Buffalo, N. Y. (Spoke shaves.)
- Williams, White & Co., Moline, Ill. (Bulldozers.)
- Wyke, J. & Co., Boston, Mass. (Machinists.)

**TOOLS, Pneumatic**

(See Pneumatic Tools.)

**TOOL GRINDERS**

- Armstrong Bros. Tool Co., Chicago, Ill.
- Athol Machine Co., Athol, Mass.
- Bath Grinder Co., 67 Walnut St., Fitchburg, Mass.
- Blount, G. J. Co., Everett, Mass.
- Bridgeport Safety Emery Wheel Co., The, Inc., Bridgeport, Conn. (Belt & motor driven.)
- Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill. "Eureka," "Gem" & "On-the-Job."
- Cincinnati Milling Machine Co., The, Cincinnati, O.
- Clizbe Bros. Mfg. Co., Plymouth, Ind.
- Edgemont Machine Co., The, Dayton, Ohio. (Wet.)
- Gisholt Machine Co., 1330 Washington Ave., Madison, Wis. "Gisholt."
- Greenfield Machine Co., 29 Mill St., Greenfield, Mass. "Greenfield."
- Lutter & Gies, 258 Lake St., Milwaukee, Wis. "Milwaukee." (Wet.)
- McCabe, J. J., 30 Church St., N. Y. City.
- Miami Valley Machine Tool Co., Dayton, O. "Dayton."
- Mummert, Wolf & Dixon Co., Hanover, Pa. (Revolving ollstone.)
- Niles-Bement-Pond Co., 111 Broadway, N. Y. City.
- Oesterlein Machine Co., The, Cincinnati, O. "Oesterlein." (Combination universal cutter & tool grinder.)
- Ransom Mfg. Co., Oshkosh, Wis. (Dry & water.)
- Rockford Drilling Machine Co., Rockford, Ill.
- Royal Mfg. Co., Lancaster, Pa. "Beats the Grindstone."
- Safety Emery Wheel Co., Springfield, O.
- St. Louis Machine Tool Co., 1405 S. 7th St., St. Louis, Mo. "St. Louis."
- Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa.
- Springfield Mfg. Co., Bridgeport, Conn.

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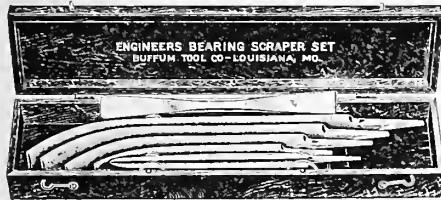
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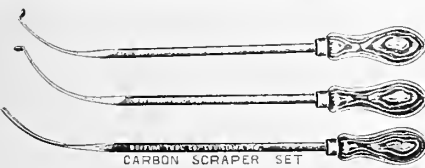
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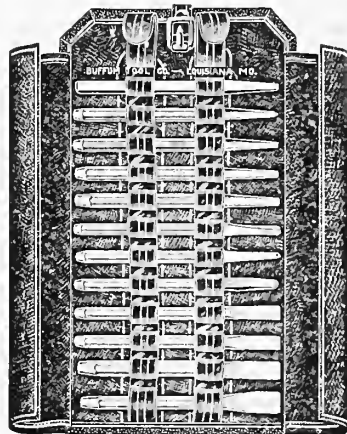
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 Tucker Machine Co., 224 E. 9th St., Cincinnati, O.  
 Vitrified Wheel Co., Westfield, Mass. "Vitrified."  
 ★Whitney Mfg. Co., Hartford, Conn. "Whitney." (Water.)  
 Woods Engineering Co., Alliance, O.

**TOOL HANDLES**

- Bliss, R. Mfg. Co., Pawtucket, R. I.  
 Chapin-Stevens Co., Pine Meadow, Conn.  
 Jennings, C. E. & Co., 42 Murray St., N. Y. City.  
 Niagara Handle & Ferrule Co., 321 N. Holliday St., Baltimore, Md. "Neversplit."  
 Ohio Tool Co., Columbus, O.  
 Piqua Handle & Mfg. Co., The, Piqua, O.  
 Sandusky Tool Co., Sandusky, O.

**TOOL HOLDERS**

- Armstrong Bros. Tool Co., Chicago, Ill.  
 Beaman & Smith Co., The, Gordon & Reynolds Aves., Providence, R. I. (Drill & tap holders.)  
 Cleveland Twist Drill Co., Cleveland, O.  
 Colton Combination Tool Co., East Hampton, Mass. (Lathe, shaper, planer & turret.)  
 Fairbanks Co., Springfield, Mass. "United States."  
 Geier, The P. A. Co., 5112 St. Clair Ave., Cleveland, O. "Geier." (Boring tool holders.)  
 Geometric Tool Co., Blake & Valley Sts., New Haven, Conn. "Geometric." (Tap holders.)  
 Graham Mfg. Co., Providence, R. I. (Knurl holders.)  
 Hill Standard Mfg. Co., Anderson, Ind. "Hill." (Lathe & planer.)  
 Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y. "Keystone." (boring & threading tool holder.)  
 ★Krieger Tool & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill. "Krieger's."  
 Lang, G. R. Co., Meadville, Pa. "Lang's."  
 Lecount, Wm. G., South Norwalk, Conn. (Steel chuck & drill holders.)  
 Millers Falls Co., 28 Warren St., N. Y. City. "Millers Falls."  
 Mingst, C. P., 1230 Riverside Ave., Evansville, Ind. "Mingst."  
 Modern Tool Co., Erie, Pa. (Tap & die holders.)  
 Nicholls, William S., 253 Broadway, N. Y. City. "T. C."  
 Ready Tool Co., New Haven, Conn. "Red-E." (Lathe & planer.)  
 Robinsons Tool Works, Waterbury, Conn. "Robinsons." (Boring.)  
 Rogers, John M. Works, Gloucester, N. J. (Adjustable hollow mills.)  
 Thompson, Henry G. & Son Co., New Haven, Conn. "Carr." (Lathe & planer tool holders.)  
 Van Doren Mfg. Co., 557-61 W. Jackson Blvd., Chicago, Ill. "Universal." (Lathe & planer.)  
 Walton Co., The, 306 Pearl St., Hartford, Conn. "Walton." (Lathe.)  
 Warner & Swasey Co., Cleveland, O. (Tool holders for lathes.)  
 Wells Bros. Co., Greenfield, Mass. "Little Giant." (Drill holders.)  
 Wells, F. E. & Son Co., Greenfield, Mass.  
 Western Tool & Mfg. Co., The, Springfield, O. "Champion."

**TOOL KITS**

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- ★Auto Spring Repairer Co., 123 Liberty St., N. Y. City. "Auto Spring Repair Co." (Auto.)  
 ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "Autokit," "Motorkit" & "Junior."  
 Brown, H. S. Co., Bridgeport, Conn.  
 Channon, H. Co., Market & Randolph Sts., Chicago, Ill. "Channon." (Auto & motor boat.)  
 Gilbert Mfg. Co., New Haven, Conn. "Gilbert."  
 Hammacher-Schlemmer & Co., 13th St. & 4th Ave., N. Y. City. "Tourist Autokit."  
 Krauter & Co., Inc., 571-579 18th Ave., Newark, N. J.  
 Mound Tool & Scraper Co., 1606-1608 N. Broadway, St. Louis, Mo. "Mound."  
 National Cutlery Co., Detroit, Mich. "National."  
 Persons Mfg. Co., 54-68 Bloomingdale Road, Worcester, Mass. (Motorcycle.)  
 Republic Belting Co., The, Cleveland, O.  
 Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill. (To order.)  
 Vibek Tool Co., The, 10709 Quincy Ave., Cleveland, O.  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "Common Sense" & "National."  
 Wieland, Chas., 147 & 149 Chambers St., N. Y. City.  
 Wilson Trading Co., The, 46 Cortlandt St., N. Y. City. (Auto.)

**TORCHES**

- Bernz, Otto, 21-43 S. 13th St., Newark, N. J. "Always Reliable." (Brazing & soldering.)  
 Best Light Co., The, Canton, O. "Best."  
 Brown, Will H., Schofield Bldg., Cleveland, O. (Air acetylene torch, for fusing aluminum.)  
 Clayton & Lambert Mfg. Co., Detroit, Mich. (Gasoline.)  
 Crescent Co., Valparaiso, Ind. "Baby." (Brazing & soldering.)  
 Globe Brass Works, 15-17 Macomb St., Detroit, Mich. "Globe." (Brazing & soldering.)  
 Kaufman, The A. G. Mfg. Co., 131-133 Reade St., N. Y. City. "Kaufman." (Brazing & soldering.)  
 Knapp Mfg. Co., N. Y. City. (Gasoline & alcohol; also blow torches.)  
 Macleod, Walter & Co., Cincinnati, O. "Buckeye." (Brazing & soldering.)  
 ★Rockwell Furnace Co., 26 Cortlandt St., N. Y. City.  
 Schneider & Trenkamp Co., East 40th St. & Penna. R. R., Cleveland, O. "Reliable." (Gasoline & coal oil illuminating torches & paint burners.)  
 United States Chaplet & Supply Co., 140 Cedar St., N. Y. City. (Kerosene & gasoline.)  
 Volcano Torch & Mfg. Co., The, 237 East 22nd St., Erie, Pa. "Volcano." (Brazing & heating torches.)  
 Wellington Mfg. Co., 18 & 20 Oak St., N. Y. City. "Wellington." (Gasoline.)

**TRANSMISSION APPLIANCES**

- American Pulley Co., 29th & Bristol Sts., Phila., Pa. "American." (Pulleys.)  
 American Tool & Machine Co., 109 Beach St., Boston, Mass. (Shaftings, pulleys, hangers & friction clutches.)  
 Bessemer Gas Engine Co., The, Grove City, Pa. "Bessemer." (Friction clutches.)  
 Blevney, John C., 216-224 High St., Newark, N. J. "Blevney." (Friction clutches.)  
 Brown Clutch Co., The, Sandusky, Ohio. (Friction clutches & pulleys.)  
 Brown & Sharpe Mfg. Co., Providence, R. I. (Pulleys.)



**TRANSMISSION APPLIANCES—Continued**

- Caldwell, W. H. & Son Co., Western Ave., 17th & 18th Sts., Chicago, Ill. (Friction clutches & pulleys.)
- Carpenter, Geo. B. & Co., 202-208 South Water St., Chicago, Ill. (Shafting.)
- Curtis & Co. Mfg. Co., Willston, Mo.
- ★Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind. (Machinery chains.)
- Dill, T. C. Machine Co., Inc., Somerset, Mascher & Mutter Sts., Phila., Pa. "Dill." (Variable speed drive.)
- Dodge Mfg. Co., Mishawaka, Ind. (Friction clutches, pulleys, shafting & hangers.)
- Edgemont Machine Co., The, Dayton, Ohio. "Edgemont." (Friction clutch pulleys, cut off couplings & extended sleeve clutches.)
- Falls Rivet & Machine Co., Cuyahoga Falls, Ohio. (Shafting, pulleys, couplings, hangers & friction clutch pulleys.)
- Hess-Snyder Co., The, Massillon, O. (Friction clutch pulleys & friction clutch cut off couplings.)
- Hilliard Clutch & Machinery Co., 104 W. 4th St., Elmira, N. Y. (Friction clutches.)
- Holliday Engineering Co., 749 Bunker St., Chicago, Ill. "Holliday." (Friction pulleys.)
- Howard Iron Works, Buffalo, N. Y. (Patterns, pulleys, sheaves, hangers, etc.)
- Huntsville Foundry & Machine Works, Huntsville, Ala. (Pulleys, collars & couplings.)
- Johnson, The Carlyle Machine Co., P. O. Box D, Manchester, Conn. "Johnson." (Friction clutches.)
- Jones, W. A. Foundry & Machine Co., North Ave. & Noble St., Chicago, Ill. (Pulleys, shafting & hangers.)
- McCabe, J. J., 30 Church St., N. Y. City. (Pulleys.)
- Manning, Maxwell & Moore, Inc., N. Y. City. "Hendershot." (Couplings.)
- Nicholson, W. H. & Co., Wilkes-Barre, Pa. "Nicholson." (Shaft couplings.)
- ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich. (Speed change gears.)
- O. K. Clutch & Machinery Co., The, Phila., Pa. "O. K." (Friction clutch pulleys.)
- Philips Pressed Steel Pulley Works, N. E. cor. 4th St. & Glenwood Ave., Phila., Pa. "Philips." (Pressed steel & cast iron split pulleys.)
- Reeves Pulley Co., Columbus, Ind. "Reeves." (Variable speed transmissions; wood split pulleys & pulley clutches.)
- ★Rockwood Mfg. Co., The, 1911 English Ave., Indianapolis, Ind. (Paper pulleys.)
- Royersford Foundry & Machine Co., Royersford, Pa. (Shaft hangers & couplings, pillow blocks, clamp boxes, etc.)
- Sellers, Wm. & Co., Inc., 1600 Hamilton St., Phila., Pa. (Pulleys.)
- Strong-Scott Mfg. Co., The, 415 S. 3rd St., Minneapolis, Minn.
- Weller Engineering Co., Elyria, Ohio. (Friction clutches & pulleys.)
- Wilmarth & Morman Co., 583 Canal St., Grand Rapids, Mich. (Loose pulleys.)
- Wood's, T. B. Sons Co., Chambersburg, Pa. (Friction clutches, shafting, shafting hangers, couplings, pulleys, etc.)
- Wright, L. Machine Works, 9-15 Alling St., Newark, N. J. (Shafting, pulleys & hangers.)

**TRUCKS, Factory**

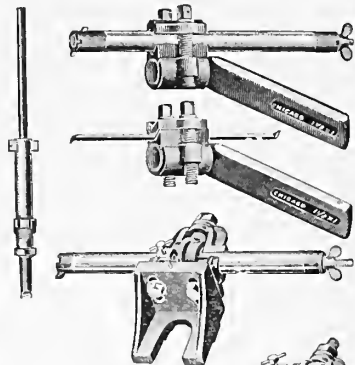
- Fancher Machine Co., The, Baldwinsville, N. Y.
- Francis, Chas. E. Co., Rushville, Ind.
- Grand Rapids Hand Screw Co., Grand Rapids, Mich.
- ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich.
- Johnstown Automobile Co., Inc., 101 Main St., Johnstown, Pa. "Betterman." (Body.)
- Lyon Metallic Mfg. Co., Aurora, Ill. "Lyon."
- ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.
- Nutting Truck Co., Faribault, Minn.

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**TUFTING MACHINES**

(See Upholstering Machinery.)

**TUMBLING BARRELS**

- Abbott Ball Co., The, 14-18 Hicks St., Hartford, Conn. (Steel balls.)
- Baird Machine Co., The, Oakville, Conn. "Baird."
- Barnett, Oscar Foundry Co., Newark, N. J.
- ★Bennett-O'Connell-Stevens Co., 97-101 S. Clinton St., Chicago, Ill.
- Bigelow Co., New Haven, Conn.
- Byram & Co., Inc., Detroit, Mich.
- Central Iron Works, 200-209 S. Front St., Quincy, Ill.
- Cleveland Tumbling Barrel & Mfg. Co., Cleveland, O.
- Druckleib, C., 178 Washington St., N. Y. City. (Sand blast.)
- ★Globe Machine & Stamping Co., The, 3950 Hamilton Ave., N. E., Cleveland, Ohio. "Globe."
- ★Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich.
- Middleditch, B., Detroit, Mich. (Tilting.)
- ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.
- Waterbury Machine Co., Waterbury, Conn.

## TURN TABLES

- ★Auto & Accessories Mfg. Co., 1416 Madison Ave., Baltimore, Md. "Norwood." (Portable turntable & jack combined.)
- Bicycle Step Ladder Co., 65 Randolph St., Chicago, Ill.
- Byram & Co., Inc., Detroit, Mich.
- Canton Foundry & Machine Co., 8th & Saxton Sts., Canton, O. "Universal."
- Ernst's, C. F. Sons, 65 Lathrop St., Buffalo, N. Y. "Ernst." (Combined turntable & wash racks.)
- Ideal Sectional Building Co., North Tonawanda, N. Y.
- Lansing Wheelbarrow Co., Lansing, Mich.
- Lund Smith Co., The, 51 Godwin St., Paterson, N. J.
- ★Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.
- Pitless Turntable Co., The, 1333 Walnut St., Kansas City, Mo. "Pitless."
- Portland Garage, Portland, Me. "Portland."
- Skinner & Skinner, Chicago, Ill.
- Sterling Elliott Co., The, Newton, Mass.
- Weber Cycle & Supply Co., 6 E. Kiowa St., Colorado Springs, Col. "Weber."
- Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass.

## TURRET MACHINES

- Cleveland Automatic Machinery Co., Cleveland, O.
- Dreses Machine Tool Co., Cincinnati, O.
- Flather, E. J. Mfg. Co., Nashua, N. H. "Flather." (Vertical.)
- Garvin Machine Co., Spring & Varrick Sts., N. Y. City.
- King Machine Tool Co., The, Cincinnati, O. (Vertical.)
- Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.

## TUYERE IRONS

- Buffalo Forge Co., Buffalo, N. Y. "Buffalo."
- Canedy-Otto Mfg. Co., Chicago Heights, Ill. "Royal" & "Western Chief."
- Huntsville Foundry & Machine Works, Huntsville, Ala.
- Illinois Iron & Bolt Co., Carpentersville, Ill.
- Jones, B. M. & Co., Inc., Connorsville, Ind.
- Swett, A. L. Iron Works, Medina, N. Y.

## TWIST DRILLS

- American Specialty Co., 834-5 Monadnock Bldg., Chicago, Ill. "Collis."
- Boker, Herman & Co., 101 Duane St., N. Y. City.
- Celfor Tool Co., Chicago, Ill. "Celfor." (Also flat.)
- Cincinnati Tool Co., Norwood, O.
- Cleveland Twist Drill Co., Cleveland, O.
- Detroit Twist Drill Co., 634-36 Fort St., W., Detroit, Mich.
- Frasse, Peter & Co., 130-32 Worth St., N. Y. City. "Poldi." (Speed.)
- Greenlee Bros., Rockford, Ill.
- Jones, B. M. & Co., Inc., 141 Milk St., Boston, Mass. (Imported.)
- Lancaster Machine & Knife Works, Lancaster, N. Y. "Oval Drive."
- Lincoln-Williams Twist Drill Co., Taunton, Mass. (Also "Pioneer" flat.)
- Morse Twist Drill & Machine Co., New Bedford, Mass.
- National Twist Drill & Tool Co., Detroit, Mich.
- Newhall Chain Forge & Iron Co., 90 West St., N. Y. City. "Banner." (Combination vise, anvil & drill.)
- ★Pratt & Whitney Co., 111 Broadway, N. Y. City.

- Standard Tool Co., Cleveland, O.
- Syracuse Twist Drill Co., Syracuse, N. Y.
- Union Twist Drill Co., Athol, Mass. "Union."
- ★Ward, Edgar T. & Son, 23-25 Purchase St., Boston, Mass.
- Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "National."
- Wiley & Russell Mfg. Co., Greenfield, Mass.

## UNIVERSAL GRINDERS

- Cincinnati Milling Machine Co., The, Cincinnati, O.
- Landis Tool Co., Waynesboro, Pa.
- Miami Valley Machine Tool Co., Dayton, O. "Dayton."
- Thompson Grinder Co., Murray & Main Sts., Springfield, O. "Thompson."
- Walker, O. S. & Co., 25 Union St., Worcester, Mass. "2K."
- Warner-Smith Lektro Products Co., The, Room 500, Neave Bldg., Cincinnati, Ohio. "Lektro."

## UPHOLSTERING MACHINERY

- Buser-Posten Tufting Machine Co., The, 66 W. Water St., Chillicothe, O.
- Lounsbury, G. H. & Sons, 107-109 W. Third St., Cincinnati, O. ("Empire" hair pickers, "Lounsbury" button machines & "Eureka" enameled goods cutters.)
- Novelty Tufting Machine Co., 1200 Michigan Ave., Chicago, Ill. (Cushion & back tufting.)
- Tufting Machine Supply Co., 1200 Michigan Ave., Chicago, Ill. "Areameter." (Leather measuring machines.)

## UPRIGHT DRILLS

- ★American Tool Works Co., The, 6th & Eggleston Ave., Cincinnati, O.
- Barnes, W. F. & John Co., 204 Ruby St., Rockford, Ill. "Barnes."
- ★Barnes Drill Co., Rockford, Ill.
- Buffalo Forge Co., Buffalo, N. Y. "Buffalo."
- Canedy-Otto Mfg. Co., Chicago Heights, Ill. "Western Chief."
- Champion Blower & Forge Co., Lancaster, Pa. "Champion." (Post.)
- Cincinnati-Bickford Tool Co., The, Spring Grove Ave. & Township St., Cincinnati, Ohio.
- Corbin-Church Co., New Britain, Conn.
- Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.
- Hamilton Machine Tool Co., Hamilton, O.
- Hilbert Machine Co., The, 2116-22 Colerain Ave., Cincinnati, O.
- Illinois Iron & Bolt Co., Carpentersville, Ill.
- Marshall & Huchart Machinery Co., 11-15 N. Canal St., Chicago, Ill.
- Mechanics' Machine Co., Rockford, Ill.
- Motch & Merryweather Machinery Co., The, 707-715 Lakeside Ave., N. W., Cleveland, Ohio.
- Noyes, B. B. Co., Greenfield, Mass. "Little Giant." (Post.)
- Prentiss Tool & Supply Co., 115 Liberty St., N. Y. City.
- Reed, Francis Co., 43 Hammond St., Worcester, Mass.
- Rockford Drilling Machine Co., Rockford, Ill.
- Silver Mfg. Co., Salem, O. "Advance."
- Snyder, J. E. & Son, Worcester, Mass.
- Superior Machine Tool Co., Kokomo, Ind. "Superior."

## VACUUM DRYERS

- Buffalo Foundry & Machine Co., Buffalo, N. Y.

## VALVE GRINDING TOOLS

Ashcroft Mfg. Co., 85-89 Liberty St., N. Y. City. "Ashcroft."  
 Auto Parts Co., 10 Weybosset St., Providence, R. I. "Apco."  
 Brown Co., The, 1071-72 S. Clinton St., Syracuse, N. Y. "Brown."  
 Crone, F. G., 49 E. Utica St., Buffalo, N. Y. "Crone." (Valve dresser & reseater.)  
 Horton Boat, Engine & Supply Co., 90 South Ave., Rochester, N. Y.  
 "Jef" Mfg. Co., The, 1562 Broadway, Denver, Colo.  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.  
 Taylor-Shantz Co., 230 Mill St., Rochester, N. Y. "Pioneer."  
 Valve Seating Tool Co., Bridgeport, Conn.

## VALVE LIFTING TOOLS

Brown Co., The, 1071-72 S. Clinton St., Syracuse, N. Y. "Brown."  
 Flexible Valve Remover Co., 12 Beverly St., Providence, R. I. "White."  
 Hoadley, F. B., 479 Willow St., Waterbury, Conn. "Hoadley." (Automatic.)  
 Long & Mann Co., The, 13 Graves St., Rochester, N. Y.  
 ★Mechanical & Electrical Mfg. Co., Rear 2227 Prairie Ave., Chicago, Ill. "Triumph."  
 Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y. "Noonan's."  
 Peterson Valve Lifter Co., The, 719 W. Jefferson St., South Bend, Ind. "Peterson."  
 Polson, W. F., 27 Chenango St., Buffalo, N. Y. "Polson."  
 Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo. "Phoenix."  
 Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City. "Hercules."  
 Smith, J. Stewart, 1779 Broadway, N. Y. City. "Dollar."  
 Weeber, C. F. Mfg. Works, 170-172 Central Ave., Albany, N. Y.

## VEHICLE WASHERS

Cataract Auto-Vehicle Washer Co., Topeka, Kan. "Cataract Auto-Vehicle Washer." (Nozzle & mop.)  
 Fiske, J. W. Iron Works, 56-58 Park Place, N. Y. City.  
 Forman, L. T. Patent Swinging Hose Bracket Co., 317 S. 12th St., Omaha, Neb.  
 Frey, John W., 722 Main St., Buffalo, N. Y. "De Luxe." (Overhead.)  
 Ideal Carriage Washer & Automatic Water Saver Co., 383 Main St., E., Rochester, N. Y. "Ideal" & "Little Giant." (Overhead revolving hose arms.)  
 Long & Mann Co., The, 13 Graves St., Rochester, N. Y. "L. & M." (Nozzle & mop.)  
 Paragon Brass Works, 87 Centre St., N. Y. City. (Overhead revolving.)  
 Perfect Mfg. Co., 189 Circular St., Saratoga Springs, N. Y. "Perfect."  
 Pietsch, Lawrence W., Room 32, 84 Washington St., Chicago, Ill.  
 Ryan & Long, Appleton, Wis. "Perfection." (Overhead.)  
 Smith, I. J. Mfg. Co., Inc., 4283 Park Ave., N. Y. City. "Irving" & "Ever Ready." (Overhead.)  
 Star Brass Works, The, 123 N. Jefferson St., Chicago, Ill. "Star."  
 ★Vehicle Specialty Co., Inc., The, 26 State St., Hartford, Conn. "Excelsior." (Revolving overhead.) "No. 2 Superior." (Illuminated revolving overhead.)  
 Warren, Marion Co., P. O. Box 45, Rochester, N. Y. "Warren's Alright." (Nozzle.)  
 Western Robe Mills, 43 Peck St., Chicago, Ill.

## VEHICLE WASHER FITTINGS

Grosselfinger, Geo., 192 Front St., N. Y. City. "Eureka." (Self-closing nozzles.)  
 ★Ideal Carriage Washer & Automatic Water Saver Co., 383 Main St., E., Rochester, N. Y. "Ideal." (Water savers.)  
 Smith, I. J. Mfg. Co., Inc., 4283 Park Ave., N. Y. City. "Irving." (Automatic water cut-off.)  
 ★Vehicles Specialty Co., The, Inc., 26 State St., Hartford, Conn. "Simplicity." (Water cut-off.)

## VERTICAL DRILLS

Fox Machine Co., 327 N. Front St., Grand Rapids, Mich.  
 Harvey, Arthur C. & Co., 374 Congress St., Boston, Mass. "Buffalo." (Hand.)  
 Niles-Bement-Pond Co., 111 Broadway, N. Y. City.  
 ★Pratt & Whitney Co., 111 Broadway, N. Y. City.

## VICES

Abernathy Vise & Tool Co., Chicago, Ill. (Patternmakers' & woodworkers'.)  
 Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill. (Combination vise, grinding, drilling machines, etc.)  
 American Wrought Anvil Co., 12-18 Richardson St., Brooklyn, N. Y.  
 Armstrong Mfg. Co., 295 Knowlton St., Bridgeport, Conn. "Armstrong." (Pipe.)  
 Athol Machine Co., Athol, Mass.  
 Ayes & Co., 1812-16 Ellen St., Chicago, Ill. "Ayes." (Woodworkers'.)  
 Barbour-Stockwell Co., Cambridgeport, Mass.  
 Barrett Machine Tool Co., Meadville, Pa. (Machinists'.)  
 Blissfield Motor Works, The, Blissfield, Mich. "Davenport." (Tilting.)  
 Bonney Vise & Tool Works, Allentown, Pa. "Bonney."  
 Braunsdorf-Mueller Co., Elizabeth, N. J.  
 Brown & Sharpe Mfg. Co., Providence, R. I.  
 Butterfield & Co., Derby Line, Vt. (Pipe.)  
 Columbian Hardware Co., Cleveland, O. (Machinists', patternmakers' & woodworkers'.)  
 Curtis & Curtis Co., Bridgeport, Conn. (Pipe.)  
 Edge, Frank & Co., 31 & 33 S. Front St., Grand Rapids, Mich. (Saw filing.)  
 Emmert Mfg. Co., Waynesboro, Pa. ("Universal," woodworkers' vises; "Universal" & "Tiger," machinists' vises & "Standard" pipe vises.)  
 Erie Tool Works, Erie, Pa. (Machinists'.)  
 Fisher & Norris, Trenton, N. J. "Fisher" & "Fisher-Brooks." (Machinists' & woodworkers'.)  
 Fox Machine Co., 327 N. Front St., Grand Rapids, Mich. (Patternmakers'.)  
 Fray, John S. & Co., Bridgeport, Conn. (Pin.)  
 Noyes, B. B. & Co., Greenfield, Mass. "Little Giant." (Drill press & foot.)  
 Fulton Machine & Vise Co., Lowville, N. Y. ("Star" machinists', "F. & R." double swivel & "Star" combination pipe.)  
 General Fire Extinguisher Co., Providence, R. I. "Providence." (Pipe.)  
 Goodell-Pratt Co., Greenfield, Mass.  
 Hollands Mfg. Co., Erie, Pa. "Holland."  
 Howard Iron Works, Buffalo, N. Y. "Howard." (Machinists'.)  
 Leiman Bros., 62 John St., N. Y. City.  
 Lord, L. L. Co., Meadville, Pa. "Meade." (Pipe.)  
 Lowell Wrench Co., 100 Exchange St., Worcester, Mass. (Hand.)  
 Massey Vise Co., 9-11 W. Michigan St., Chicago, Ill. ("Lightning" woodworkers', "Perfect," "Clincher" & "Lightning," machinists' & "Perfect," pipe.)  
 Merrill Bros., Maspeth, N. Y. (Pipe.)

★ indicates Advertisers—see Index in back of book.

**VICES—Continued**

Newhall Chain Forge & Iron Co., 90 West St., N. Y. City. "Banner." (Combination vise, anvil & drill.)  
 Orange Machine & Mfg. Co., The, 10-14 Stetson St., Orange, N. J. "Ideal." (Pipe.)  
 Parker, Chas. Co., Meriden, Conn. "Parker."  
 Phoenix Hardware Mfg. Co., Homer, N. Y. "Phoenix."  
 Pittsburgh Automatic Vise & Tool Co., The, Pittsburgh, Pa. "Pittsburg."  
 Prentiss Vise Co., 44 Barclay St., N. Y. City. "Prentiss," "Bull Dog," "Monarch," "Lewis," "Anchor," "Shepherd" & "Rex."  
 Reed Mfg. Co., Erie, Pa. (Pipe & machinists').  
 Rock Island Mfg. Co., Rock Island, Ill. "Rock Island." (Machinists', woodworkers' & pipe.)  
 Rogers, Printz & Co., Warren, Pa. "Arpeco."  
 Schuchardt & Schutte, 90 West St., N. Y. City. "Pioneer." (Portable.)  
 Sheldon, E. H. & Co., Chicago, Ill. (Pattern-makers' & woodworkers').  
 Smith, Otis A., Rockfall, Conn.  
 Spitzli Mfg. Co., 6-14 Devereaux St., Utica, N. Y. "Star" & "Peerless."  
 Starrett, L. S. Co., Athol, Mass. (Small.)  
 Toledo Pipe Threading Machine Co., The, Toledo, O. (Pipe.)  
 Toles, W. C. Co., 4034-36 N. 42nd St., Irving Park, Chicago, Ill. (Woodworkers' rapid acting.)  
 Vanderbeck Tool Works, 622 Capitol Ave., Hartford, Conn. "Handy."  
 Wells, F. E. & Son Co., Greenfield, Mass. "Wells." (Pipe.)  
 Williamson Vise Co., Bradford, Pa.  
 Yost, G. M. Mfg. Co., Meadville, Pa. "Yost's." (Machinists').

**VOLTMETERS, For Panel & Vehicle Use**

Bristol Co., Waterbury, Conn. "Bristol." (Panel.)

Clark Electric Meter Co., 141-43 S. Clinton St., Chicago, Ill.  
 Eldredge Electric Mfg. Co., 3 Post Office Sq., Springfield, Mass. "Advance."  
 International Electric Meter Co., 330 W. Randolph St., Chicago, Ill.  
 Keystone Electrical Instrument Co., 9th St. & Montgomery Ave., Phila., Pa.  
 Pignolet, L. M., 78 Cortlandt St., N. Y. City.  
 Reliance Instrument Co., 527 W. Van Buren St., Chicago, Ill. "Reliance."  
 Robert Instrument Co., 56 Shelby St., Detroit, Mich. "Robert."  
 Weston Electric Instrument Co., Waverly Park, Newark, N. J. "Weston."

**VULCANIZERS**

Atlas Rubber Co., Niagara & Massachusetts Aves., Buffalo, N. Y. "Atlas."  
 ★Auto Improvement Co., The, 304 Hudson St., N. Y. City. "Ever Ready."  
 ★Auto-Tire Vulcanizing Co., Lawrence St., Lowell, Mas. "Auto-Tire." (Also retreading kettles.)  
 Bacon, Frank W., Omaha, Neb. "American." (Steam, for retreading & combination, for tube & sectional work.)  
 Baum Iron Co., 1216 Harney St., Omaha, Neb. "American." (Combination.)  
 Bean Son Co., The, Cleveland, O. "Empire."  
 Biggs Boiler Works Co., Akron, O.  
 Buffalo Electric Vulcahizer Co., 122 Erie Co. Bank Bldg., Buffalo, N. Y. "Buffalo." (Electric.)  
 Buffalo Foundry & Machine Co., Buffalo, N. Y.  
 ★Craft Combination Steam Vulcanizer Co., 301 E. 48th St., Minneapolis, Minn. "Craft." (Steam, gas or gasoline.)

# CRAFT

## Combination Steam Vulcanizer

### COMPANY

Vulcanizers, Moulds  
and  
Retreading Kettles



1910  
Special Offer  
**\$150.00**

including three moulds  
3", 3½", 4"

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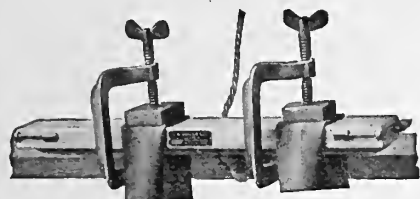
There are no adjustments

One Vulcanizer for every  
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tube made

No Boiler required to operate  
this Vulcanizer; it makes its  
own steam.

This Vulcanizer can be fitted to use with Gas, Gasoline or connect with Steam Boiler. This outfit is sufficient for any ordinary garage use. Send for printed matter on other Vulcanizers. Oldest Manufacturers of Vulcanizers in the Northwest.

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# VULCANIZE

## SIX tubes

## in Fifteen minutes

Here's what so many garage men have been urging us to make—a multiple inner-tube vulcanizer.

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## GANG ELECTRIC VULCANIZER

The heat is generated by simply connecting to your city current and is *automatically* regulated, about 1½c. worth per hour being consumed. There is no boiler to explode. No danger of fire because there is no flame. Each point of the vulcanizer receives the same amount of heat.

Six tubes can be vulcanized as quickly as one and each repair is independently removable from the heater. A blow-out twenty-four inches long can be repaired at one sitting.

PRICE, \$25.00

We are makers of the only perfect PRIVATE OWNERS' model - \$12.50

A liberal discount to garages and repair men.

Write now for full description.

C. A. SHALER CO., Box P, Waupun, Wis., U. S. A.

## MAKE YOUR TIRES GO TWICE AS FAR AND SAVE MONEY ON YOUR TIRE REPAIRING

You can do both by patching your inner tubes and casings with

## Auto Eleck-Trick Vulcanizer

The Vulcanizer does perfect work and when used on cuts, when they are small, prolongs the life of your tire and saves expensive repair bills.



The outfit is compact, simple in construction, easy to operate and so durable that it will last a lifetime.

Send for illustrated booklet.

Can be used with either direct or alternating current.

PRICE, COMPLETE WITH REPAIR MATERIAL - - - - \$12.00 Garage Repair Kit, \$3.00 extra.  
Special discounts to dealers.

JAMES L. GIBNEY & BRO., 211 N. Broad St., Philadelphia

**VULCANIZERS—Continued**

- Electric Vulcanizer Co., 618 3rd Ave., S., Minneapolis, Minn. "Evans." (Electric.)
- ★Fisk Rubber Co., Chicopee Falls, Mass. "Fisk."
- ★Gibney, J. L. & Bro., 215-17 N. Broad St., Phila., Pa. "Auto Elecktric."
- ★Goodrich, B. F. Co., Akron, O.
- ★Haywood Tire & Equipment Co., 332 N. Illinois St., Indianapolis, Ind. "Marble-Haywood."
- Kerr-Griffin Vulcanizer Mfg. Co., 5919 Penn Ave., Pittsburg, Pa. "Little Gem." (Steam.)
- Miller, Chas. E., Anderson, Ind.
- Motor Tire Repair & Supply Co., 5918 Baum St., Pittsburg, Pa. "Griffin."
- National Motor Supply Co., Cleveland, Ohio. "National." (Portable steam.)
- Ohio Rubber Co., 725-27 St. Clair Ave., N. W., Cleveland, O.
- O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil."
- ★Rice & Dayton Mfg. Co., Cedar Falls, Iowa. "Little Wonder."
- Savetire Co., 83 First Ave., Grand Rapids, Mich. "The Save-Tire."
- Segerstrom Vulcanizer Co., 219 S. 7th St., Minneapolis, Minn. "Segerstrom." (Electric & gas.)
- ★Shaler, C. A. Co., Waupun, Wis. "Shaler." (Electric.)
- ★Stitch-in-Time Vulcanizer Co., 118 E. 7th St., Topeka, Kan. ("Stitch-Nine, portable. "Stitch-in-Time" & "The Pig.")
- Williams Foundry Machine Co., Akron, Ohio. "Akron-Williams."
- Wishart-Burge Machine Works, 58-66 N. Jefferson St., Chicago, Ill. "Excelsior" & "Boilerless." (Steam.)
- Industrial Oxygen Co., Hanover St. Bldg., N. Y. City. (Oxy-acetylene welding apparatus, oxygenite process.)
- Macleod, Walter & Co., Cincinnati, O. "Buck-eye." (Oxy-acetylene.)
- ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I.
- New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City. "Futterman."
- Phillips Lafitte Co., The, Phila., Pa. (Welding plates; welding & tempering powder.)
- Pollard Engineering Co., 165-169 N. Jefferson St., Chicago, Ill.
- Sanford, F. C. Mfg. Co., Bridgeport, Conn. "Sanford." (Portable welding machines.)
- Tariffville Oxygen & Chemical Co., Tariffville, Conn. (Oxygen gas in cylinders.)
- Thomson Electric Welding Co., Lynn, Mass. "Thomson." (Electric welding machines.)
- Toledo Electric Welding Co., The, Knowlton & Langland Sts., Cincinnati, O. (Electric welding machines.)
- Union Welding Co., 1551 Michigan Ave., Chicago, Ill. (Oxygen & acetylene process.)
- Waterhouse Co., The, 6 Pelham St., Boston, Mass. "Waterhouse."
- ★Western Welding & Mfg. Co., 557 W. Jackson Blvd., Chicago, Ill. "Western." (oxy-acetylene welding plants.)

**WHEEL GUARDS**

- Fiske, J. W. Iron Works, 56-58 Park Place, N. Y. City. (For doors to garages.)

**VULCANIZER BOILERS**

- Carlin's, Thos. Sons Co., 1600 River Ave., N. E., Pittsburg, Pa.

**VULCANIZER MOULDS & CORES**

- ★Auto-Tire Vulcanizing Co., Lawrence St., Lowell, Mass. (Cores & coils.)
- ★Craft Combination Steam Vulcanizer Co., 304 E. 48th St., Minneapolis, Minn. "Craft." (Tire moulds.)
- O'Neil Tire & Protector Co., Akron, Ohio. "O'Neil." (Bead moulds.)
- Williams Foundry & Machine Co., Akron, Ohio. (Tire moulds.)

**WASHERS, Vehicle**

(See Vehicle Washers.)

**WASTE CANS**

(See Cans, Waste.)

**WELDING EQUIPMENT**

- Brown, Will H., Schofield Bldg., Cleveland, O. (Electric & acetylene welding machines.)
- Cortland Welding Compound Co., Cortland, N. Y. "Climax," "Cherry Heat," "Borax-ette," "Vulcan" & "Diamond."
- Davis-Bournonville Co., 90 West St., N. Y. City. (Oxy-acetylene welding equipment.)
- Dingee, Mont. H., Lynchburg, Va. "Sparger's." (Welding compounds.)
- ★Dopp, H. W. Co., Buffalo, N. Y. "Lavosite."
- Eberhard, C. F., 25 Helen St., Buffalo, N. Y. (Oxy-acetylene.)
- Goldschmidt Thermit Co., 90 West St., N. Y. City. (Thermit.)
- American Oxygen Co., Hanover St. Bldg., N. Y. City. (Oxy-acetylene welding apparatus, oxygenite process.)
- Macleod, Walter & Co., Cincinnati, O. "Buck-eye." (Oxy-acetylene.)
- ★Morgan, B., Tew's Court, Old Beach Road, Newport, R. I.
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- Waterhouse Co., The, 6 Pelham St., Boston, Mass. "Waterhouse."
- ★Western Welding & Mfg. Co., 557 W. Jackson Blvd., Chicago, Ill. "Western." (oxy-acetylene welding plants.)

**WHEEL TRUERS, Cycle**

- Dudly Tool Co., Menominee, Mich.
- Noonan Tool & Machine Works, 103½ & 105 Dominick St., Rome, N. Y.

**WOOD WORKING MACHINERY**

- Advance Machinery Co., The, Toledo, O.
- Alpena Industrial Works, Alpena, Mich. "Kline's."
- American Wood Working Machinery Co., Rochester, N. Y.
- Badger State Machine Co., Janesville, Wis.
- Baldwin, Tuthill & Bolton, Grand Rapids, Mich.

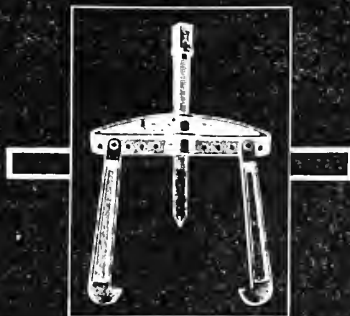
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# Crane's Improved Patent Wheel Puller

**DROP FORGED  
FROM HIGH  
CARBON STEEL**

**NO REPAIR SHOP  
SHOULD BE  
WITHOUT ONE**

Easily removes  
transmission gears,  
auto wheels,  
fly wheels,  
cams,  
propellers, etc.



Made in two sizes,  
with two  
or  
three arms.  
Pullers designed  
for special service.

FOR SALE BY ALL FIRST-CLASS DEALERS IN AUTO SUPPLIES AND HARDWARE

**THE CRANE PULLER CO**

15 HARVARD AVE. :: : :: ALLSTON, MASS.

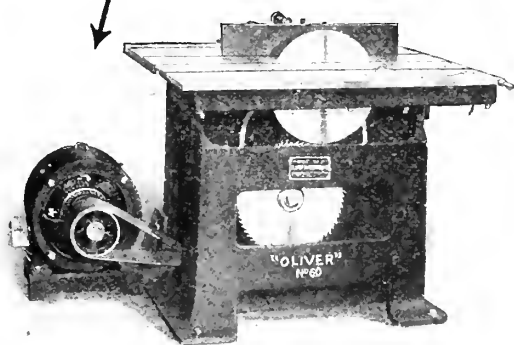
## Pattern & Body Shop Equipment

## Motor Drive

is our SPECIALTY

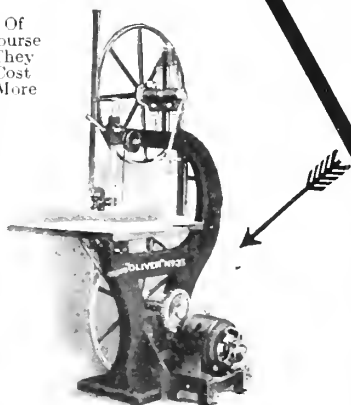
"Oliver" stands for  
quality either in **Belt  
Driven or Individ-  
ual Motor Driven**  
Woodworking Machinery.

?



**"Oliver" No. 60 Universal Saw Bench**  
—Direct Motor Drive—

Of  
Course  
They  
Cost  
More



**No. 35 Band Sawing Machines**  
A. C. Motor Drive

Investigation will prove to you that the leading automobile and auto-body manufacturers are using "Oliver" Woodworking tools, because "Oliver" makes only high-class machinery—profit producers. Write to

**OLIVER MACHINERY COMPANY**

25 to 45 Coldbrook, Grand Rapids, Mich.

BRANCH OFFICES:

50 Church St., Hudson Terminal, New York City; First National Bank Building, Chicago; Pacific Building, Seattle, Washington; 201-203 Deansgate, Manchester, England.



**WOOD WORKING MACHINERY—Continued**

- Bentel & Margedant Co., The, Hamilton, O. "Hamilton." (Rip & cross cut saws, wheel borers & boxers, wheel facers, rim borers, rounders & planers.)
- Black Bros. Machinery Co., Mendota, Ill. (Power & hand veneer presses.)
- Clemmons Machine Co., Hornell, N. Y. "Clemmons." (Rubbing & polishing machines.)
- Colladay, Jas. O. Co., 624-26 Race St., Phila., Pa.
- Cordesman, Meyer & Co., 50-56 Central Ave., Cincinnati, Ohio. (For boat & launch builders & body makers.)
- Cordesman-Rechtin Co., Cincinnati, O. "Cordesman-Rechtin." (Rip & cross cut saws & surfacers.)
- Crescent Machine Co., The, Leetonia, Ohio. "Crescent." (Jointers, variety woodworkers & surfacers.)
- ★Defiance Machine Works, The, Defiance, O. (Wheel, spoke, hub, rim & body.)
- Fay, J. A. & Egan Co., 236-56 W. Front St., Cincinnati, O.
- Fox Machine Co., 327 N. Front St., Grand Rapids, Mich. (Universal trimmers.)
- Francis, Chas. E. Co., Rushville, Ind. (Veneer presses, etc.)
- Greaves, Klusman & Co., N. E. Cor. Cook & Alfred Sts., Cincinnati, O.
- Greenlee Bros. & Co., Rockford, Ill. "Greenlee."
- Hall & Brown Wood-Working Machine Co., 1913-29 N. Broadway, N. Y. City. (Rip saws, gang saws, cut-off saws & combination saws.)
- Heath, W. A. Machine Co., Inc., Lestershire, N. Y.
- Huntsville Foundry & Machine Works, Huntsville, Ala. (Wood sawing machines.)
- Kane & Roach, Syracuse, N. Y. (Bending & straightening rolls, rim & wheel machinery, etc.)
- Kemp, J. P., 1618 Ruskin Ave., Baltimore, Md.
- Lovell Machine Works, Gardner, Mass. (Gang saws & trimmers.)
- New Holland Machine Co., New Holland, Pa. "New Holland." (Rip & cross-cut saws.)
- Ober Mfg. Co., The, Chagrin Falls, Ohio. (Spoke making machinery.)
- ★Oliver Machinery Co., Grand Rapids, Mich. (Wood trimmers.)
- Pettingill Machine Co., The, 79 Elm St., Amesbury, Mass. (Body machinery.)
- Prybail, P., 512-14 W. 41st St., N. Y. City.
- Ross, Josiah Mfg. Co., 1443-59 Niagara St., Buffalo, N. Y.
- Root, B. M. Co., York, Pa. "Root." (Rim bending machines; rim packer; self-feed rip saws, etc.)

**WOOD WORKING TOOLS**

- Fox Machine Co., 327 N. Front St., Grand Rapids, Mich. (Dado saws.)
- Mattison, C. Machine Works, Beloit, Wis. (Dado heads.)
- ★Ochsner, The A. & Sons Co., New Haven, Conn. (Body makers' tools.)
- ★Oliver Machinery Co., Grand Rapids, Mich. (Saw arbors, etc.)
- White, L. & I. J. Co., Buffalo, N. Y. (Deck scrapers & gauges.)

**WRENCHES**

- American Tap & Die Co., Greenfield, Mass. "Eagle" & "American." (Tap.)
- Armstrong Mfg. Co., 295 Knowlton St., Bridgeport, Conn. "Armstrong." (Pipe.)
- Athol Machine Co., Athol, Mass.
- Automatic Wrench Co., First National Bank Bldg., Chicago, Ill.
- Barnes Tool Co., The, New Haven, Conn. "Barnes."

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# "DEFIANCE"

## WOOD-WORKING MACHINERY

For Making

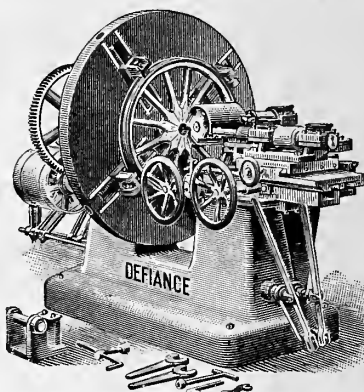
**AUTOMOBILE SPOKES, RIMS, WHEELS**

and Bodies, Carriage and Wagon Hubs, Spokes, Wheels and Rims, Wagons, Carriages, Shafts, Poles, Neck Yokes, Single Trees, Hoops, Handles, Spools, Bobbins, Insulator Pins, Table Legs, Balusters, Oval Wood Dishes, and for General Wood Work.

Invented and Built by

### THE DEFIANCE MACHINE WORKS

#### DEFIANCE, OHIO



No. 100 Automobile Wheel Facer and Borer.

- Bay State Tap & Die Co., Mansfield, Mass. "Bay State." (Tap.)
- ★Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill. "B. & R."
- Belden Machine Co., The, Whalley Ave. & Tyron St., New Haven, Conn. "Hayden."
- Bemis & Call Hardware & Tool Co., 983 Main St., Springfield, Mass. "B. & C."
- ★Besly, Chas. H. & Co., 15-21 S. Clinton St., Chicago, Ill.
- Billings & Spencer Co., 216 Lawrence St., Hartford, Conn. ("Billings" bicycle & "B. & S." auto.)
- Bonner, C. E. Mfg. Co., Chrisman, Ill. "Victor."
- Bonney Vise & Tool Works, Allentown, Pa. "Bonney."
- Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
- Brown Co., The, 1071-73 S. Clinton St., Syracuse, N. Y. "Brown." (Spark plug & ratchet wire.)
- Butterfield & Co., Derby Line, Vt. (Tap.)
- C. M. B. Wrench Co., Industrial Bldg., Syracuse, N. Y. "Silver King."
- Carpenter, The J. M. Tap & Die Co., Pawtucket, R. I. (Tap.)
- Central Brass & Fixture Co., The, Springfield, Ohio. (Spark plug.)
- ★Coes Wrench Co., Worcester, Mass. "Coes." (Auto & motorcycle.)
- Conant & Donelson, Greenfield, Mass. "Reliable." (Tap & reamer.)
- Crescent Tool Co., Jamestown, N. Y. "Crescent."
- Cronk & Carrier Mfg. Co., Elmira, N. Y. "Cronk." (Adjustable.)
- ★Cutter, Geo. A., Taunton, Mass. "Bay State Autokit" & "Bay State Stickit."
- Denham, Edwin A. Co., 45 W. 34th St., N. Y. City.
- Drop Forging Co. of New York, West Side Ave. & Fisk St., Jersey City, N. J. "Spartan." (Chain pipe.)
- Dudly Tool Co., Menominee, Mich.



**THIS IS THE FAMOUS RONSON WRENCH**

PATENTED IN U.S. AND ABROAD  
OTHER PATENTS PENDING.



**LIGHT SIMPLE** **COMPACT STRONG**

**THE WRENCH THAT IS NINE WRENCHES IN ONE. THE CLEVEREST, MOST PRACTICAL TOOL for ALL NUT-FASTENED MACHINERY.**

**PRICE \$1.50**

**FOR SALE HERE.**




## Display Stand—FREE! Get One Right Away!

Actual size, 12" x 8", made of strong crystalloid, with easel back to stand on counter or show case, and with cord to hang up if desired. Colors: Silver, Red, Black and White.

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Shown in actual colors and size on crimson background.

A HANDSOME, EFFECTIVE PIECE OF WORK

## A Silent Salesman of the Best Kind

A POSTAL BRINGS IT RIGHT AWAY

Are you making up your Stock List for Spring? Don't fail to include a liberal order for

## Ronson Wrenches

A Good Tool for Your Customer and Good Profit for You

We are ready to take good care of you. Write NOW.

MANUFACTURERS AND PATENTEES

**THE RONSON SPECIALTY COMPANY**

7, 9, 11, 13, 15 Mulberry Street

NEWARK, N. J.

Beware of Imitations!

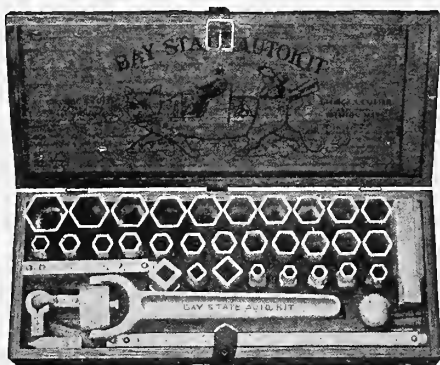
**WRENCHES—Continued**

Eames Tool Co., Inc., Lynn, Mass. "Eames."  
(Socket & spark plug.)  
Edmonds-Metzel Mfg. Co., 1910-20 Kinzie St.,  
Chicago, Ill. "Universal" & "Perpetual."  
Erickson, P. E. & Son, Port Chester, N. Y.  
Erie Stamping & Mfg. Co., Erie, Pa. "Esco."  
Erie Tool Works, Erie, Pa. (Pipe.)  
Goodell-Pratt Co., Greenfield, Mass. (Tap &  
reamer.)  
Hall, Chas. E. Co., 106 Broadway, Buffalo,  
N. Y.  
Handy Tool Co., The, Bellevue, O.  
Harris & Reed Mfg. Co., 1500-1518 W. 15th  
St., Chicago, Ill. "Service" & "Alligator."  
(Also special.)  
Hawkeye Wrench Co., Marshalltown, Iowa.  
Hawkeye.  
Herbrand Co., Fremont, O.  
Hjorth, Wm. & Co., Jamestown, N. Y. "Em-  
pire," "Lightning" & "Hjorth."  
Indianapolis Drop Forging Co., Indianapolis,  
Ind.  
Kelly, John, Congress St. & 48th Ave., Chi-  
cago, Ill. "Kelly." (Tire.)  
Keystone Mfg. Co., 41-51 Chandler St., Buf-  
falo, N. Y. "Westcott," "Keystone" &  
"Giant."  
Keystone Steel Castings Co., Chester, Pa.  
Kilborn & Bishop Co., 81 Lloyd St., New  
Haven, Conn. "Saxon."  
Kraeuter & Co., Inc., 571-79 18th Ave., New-  
ark, N. J. "Victor." (Alligator.)  
Lakeside Forge & Wrench Co., Erie, Pa.  
"Lakeside."  
Lamson & Sessions Co., 2188 Scranton Road,  
Cleveland, O.  
Lind Universal Tool Co., 75 Westminster St.,  
Providence, R. I. "Lind."  
Lord, L. L. Co., Meadville, Pa. "Lord."  
(Ratchet.)  
Lowell Wrench Co., 100 Exchange St., Wor-  
cester, Mass. "Multo." (Socket ratchet.)  
Marbach, F. G. Co., Medina, Ohio. (Ratchet  
tap.)

Menominee Electric Mfg. Co., Menominee,  
Mich. "Dudley." (Combination.)  
Monsen, A., 329 N. Clark St., Chicago, Ill.  
Moore Drop Forging Co., Brightwood, Spring-  
field, Mass.  
Morse Twist Drill & Machine Co., New Bed-  
ford, Mass.  
★ Mossberg, Frank Co., Attleboro, Mass. "Ster-  
ling," "Diamond," "Alderman," "A," "B,"  
"National" & "Junior."  
★ Motor Parts Co., Plainfield, N. J. "Auto Cle"  
& "Titus Cle."  
National Jack & Mfg. Co., 132-34 S. Clinton  
St., Chicago, Ill. (Also spark plug  
wrenches.)  
★ National Tube Co., Frick Bldg., Pittsburg, Pa.  
(Cock.)  
New Britain Mfg. Co., New Britain, Conn.  
"Pick-Up."  
O. K. Tool Holder Co., Shelton, Conn. "O. K."  
(Boxed socket.)  
Oswego Tool Co., Oswego, N. Y. "Oswego."  
Patterson, Gottfried & Hunter, Ltd., 146-150  
Centre St., N. Y. City. (Offset handle.)  
Peck, Stow & Wilcox Co., Southington, Conn.  
Pedersen Mfg. Co., 636-44 First Ave., N. Y.  
City. "Ferret."  
Perfection Supply Co., Detroit, Mich. "Per-  
fection." (Spark plug key.)  
Perfection Wrench Co., The, 18 North Main  
St., Port Chester, N. Y. "Perfection."  
Pierce, Geo. W. & Co., 2203 S. Main St., An-  
derson, Ind. "Pierce." (Spark plug.)  
Pittsburg Gage & Supply Co., 30th & Liberty  
Sts., Pittsburg, Pa. "Bestovall."  
Pratt, Wm. E. Mfg. Co., 91 Lake St., Chi-  
cago, Ill.  
Rex Wrench Co., Boston, Mass. "Rex."  
Richards Mfg. Co., The, Aurora, Ill. "Wiz-  
ard." (Adjustable ratchet.)  
Ripley Pipe Wrench Co., Ripley, N. Y.  
"Leader." (Pipe.)  
Roebling's, John A. Sons Co., Trenton, N. J.  
Rogers, Printz & Co., Warren, Pa. "Arpeco."  
(Pipe & bolt.)



in your tool roll or under the cushion or in your car somewhere! You are sure to want it. Double ended ratchet wrench and seven strong stamped steel sockets strung on a steel stick. It only costs Three Dollars! extra socket sizes to suit, five on a ring for a dollar.



There are three Bay State sets of ratchet and socket wrenches.

Bay State Autokit, large	-	\$10.00
Bay State Autokit, small	-	8.50
Bay State Stickit	- - -	3.00

All are guaranteed.

**GEO. A. CUTTER,** Sales Agent, **Taunton, Mass.**

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**WRENCHES—Continued**

★Ronson Specialty Co., 7 Mulberry St., Newark, N. J. "Ronson."  
 Roren Drop Forge Co., Providence, R. I.  
 Shawver Co., The, Springfield, O.  
 Simplex Mfg. Co., The, 90 West St., N. Y. City. "Anderson Turn-More."  
 Smith, H. D. & Co., Plantsville, Conn. "Perfect Handle."  
 Somers, Fittler & Todd Co., 327 Water St., Pittsburg, Pa.  
 Starrett, L. S. Co., Athol, Mass. (Tap.)  
 Stevens & Co., 375 Broadway, N. Y. City. "Esco."  
 Stortz, John & Son, 210 Vine St., Phila., Pa. "Alltogether."  
 Syracuse Wrench Co., Franklin & Water Sts., Syracuse, N. Y. ("Yala" & "Champion" ratchet, "Vian's Auto Grip," pipe & "Champion" spark plug.)  
 Trump Bros. Machine Co., Wilmington, Del. "Trump." (Chuck.)  
 Twin Grip Wrench Co., 25 Old Slip, N. Y. City. "Twin Grip."  
 Wakefield, J. E., Worcester, Mass.  
 Walden Mfg. Co., 65 Beacon St., Worcester, Mass. "Walden." (Tire lug ratchet wrench.)  
 Walworth Mfg. Co., 123 Federal St., Boston, Mass. "Stillson."  
 Waterloo Drop Forge Co., Falls Ave. & Orr St., Waterloo, Iowa.  
 Welch, Thomas F. Co., 55 Sudbury St., Boston, Mass. (Tap.)  
 Wells Bros. Co., Greenfield, Mass. "Little Giant." (Tap, nut & ratchet.)  
 Wells, F. E. & Son Co., Greenfield, Mass. "Wells." (Pipe.)  
 Whitaker Mfg. Co., The, 509 W. Monroe St., Chicago, Ill. "Whitaker."  
 Williams, J. H. & Co., 150 Hamilton Ave., Brooklyn, N. Y. "William."  
 Wright Wrench Mfg. Co., The, 922 S. Market St., Canton, O. "Wright."

## Full Mould Open Cure Method of Repairing Tires

At Once Convinces Autoists of its Immense Superiority  
to the Old Way

The Mould Fits the Tire  
 The Tire Cannot Stretch  
 The Tire Holds It's Original Shape  
 The Fabric will not Buckle  
 The Beads Do Not Get Crushed  
 There is No Unevenness of Tread

### 1500 to 3000 Miles More Service

judged by age and condition, are secured from our  
**Full Mould Open Cure Method of Tire  
 Repairing** (of which we are the only users) as-  
 sureing you **Practically New Tires.**

Cost is No More Than the Old Defective  
Methods

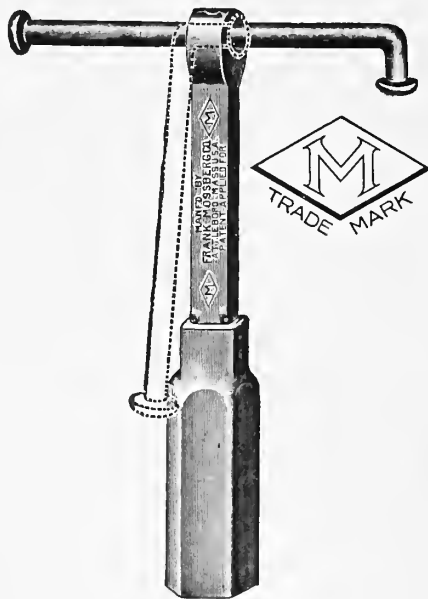
## The Baines Moore Tire Co.

Get Our Booklet  
 Retreading Auto Tires

1306 Callowhill St.  
 Philadelphia, Penna.

# MOSSBERG

## Socket Wrench



1-3 SIZE  
 Patent applied for

### Mr. Dealer:

Does it pay to sell a wrench which is without reputation? We ask you this question knowing that if you have had experience with any of the many inferior makes of wrenches, you will answer "NO!" There is always one line of wrenches you can buy and sell with safety—the **Mossberg Socket Wrench.** They are neat, strong and inexpensive, thoroughly case-hardened—especially adapted for automobile kits and equipment.

**Socket Wrench Set No. 6** has eight pressed steel sockets, and fits all sizes in general use. Neatly and conveniently packed in a leather or wooden case.

May we send you further particulars?

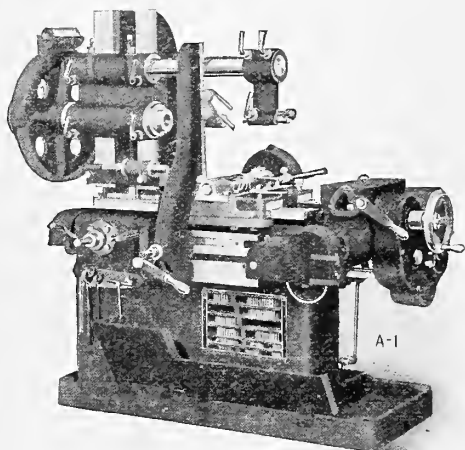
**FRANK MOSSBERG CO.**  
 ATTLEBORO, MASS.

45-47 Lake St., Chicago  
 543 Golden Gate Ave., San Francisco  
 Export Agents: Guiterman, Rosenfeld & Co.  
 35 S. William St., New York City

## Descriptions of New Automobile Machine Tools

### THE "CINCINNATI" AUTOMATIC SPUR GEAR CUTTER

The No. 3, 26x10 inch Full Automatic Spur Gear Cutter illustrated herewith, the size adapted for automobile transmission work, has been designed with a view to securing rigidity, large wearing surfaces and simplicity of parts. The power is transmitted through one pulley, running at a constant speed, and the various speeds and feeds are obtained by transposing gears, conveniently located. All gibs are of the taper type, adjustable from the ends. All shafts and spindles are accurately ground and are journaled in bronze bushes. The movements are all automatic, each being dependent on the preceding one and cannot take place until it has been completed.



The "Cincinnati" No. 3, 26 x 10-inch Full Automatic Spur Gear Cutter.

The work saddle is so gibbed to the housing that the work arbor and blank do not drop out of parallelism when the clamps are loosened for adjusting the work for the tooth depth. A graduated collar or micrometer, reading .001 of an inch, is provided on the elevating screw, which is operated by hand from the front of the machine.

The work spindle, of steel, is accurately ground and journaled in bronze bushes, and has provision for taking up wear.

The cutter slide has rectangular guiding surfaces (instead of the usual dovetail) with long taper gibs, for taking up wear, both vertically and horizontally. The tappets, or dogs, for adjusting the length of feed of cutter slide, are operated by a crank wrench from the front of the bed, the most convenient position for the operator. A retractable tappet, for the adjustable dogs, is provided, so that the slide can be run to the extreme back position, for removing blanks

without disturbing the setting of the dogs. The cutter slide returns at a constant speed, regardless of the rate of feed.

The cutter spindle, of large diameter, is accurately ground and has easily accessible means for taking up wear. The spindle has both a taper and a straight bearing and is journaled in a bronze bearing that is adjustable endwise for centering the cutter to a gauge furnished with the machine. The drive is through a worm and wheel, with means for taking up end thrust wear of the worm.

The indexing mechanism is of simple construction. The index worm can be disengaged from the wheel quickly and brought back into the exact meshing depth, or the worm can be disengaged from the index gears and rotated any desired amount for resetting work, and again secured to the index gears. This indexing mechanism is so interlocked with the cutter slide feed that it is impossible for the cutter to advance until the work is properly indexed, or when the cutter is feeding to index, thus making it impossible to spoil work. The work spindle can be made to space once or revolve continuously by a hand movement under control of the operator.

The friction operating stop disc is simple and accessible, as it is not necessary to dismantle any part of the machine to adjust the friction. While index change gears are furnished to cut all teeth from 12 to 100, and with the exception of prime numbers and their multiples from 100 to 450, the machine is so arranged that the work spindle may be rotated 90 degrees for the purpose of milling four-keyed transmission shafts, it being possible to finish such a shaft, 5¼ inches long, with ease in eight minutes. Both overhead and outer supports for the work arbor, and rim support for the gear blanks, are furnished. The machine is made by the Cincinnati Gear Cutting Machine Company, of Cincinnati, Ohio.

### THE "ECLIPSE" POWER HACK SAW

This machine is the product of the Eclipse Machine Company, of Elmira, N. Y. It is claimed to saw round, square, hex, flat or octagon steel bars, with absolute accuracy, having a variation of not more than 2-1000 inches in a four inch bar.

A patented chuck designed upon a new and unique principle is used for holding the material. It will hold firmly, any size of round steel from ¾ inches up to and including 6 inches, and squares up to 4 inches in size; and is equally effective in any and all sizes and shapes. It is quickly



The "Eclipse" Power Hack Saw.

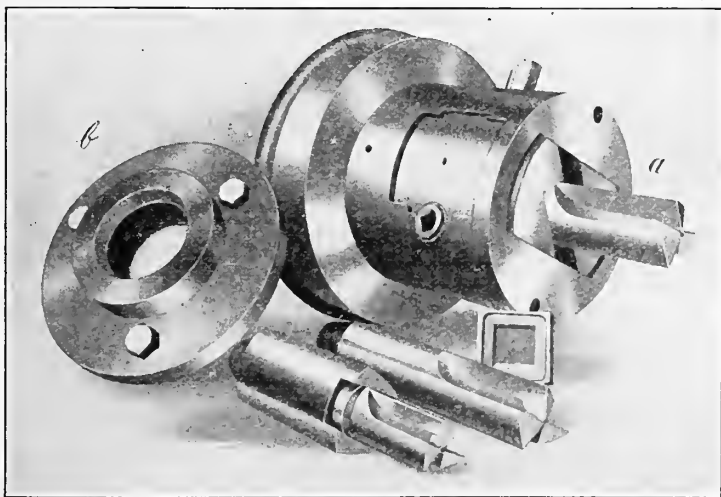
operated with a single screw actuating device that is easy and quick in its operation. The saw is equipped with a simple stop device for setting the stock at any length desired to be cut. An ordinary 20-inch hack saw blade is used and the method employed of turning the stock so as to always present to the saw an easy cutting surface, saves the saw and makes it last longer.

The machine itself is substantially built with box bed base with ample metal in all parts, guaranteed to stand excessive strain. The power required to run it is very small, not over one-half horse. The weight of the machine is 650 pounds, and the floor space required, 4x2 feet. It is furnished fully equipped with one adjustable roller rest, as illustrated, three fork rests, wrenches, etc. Price, \$150.00.

#### A TOOL FOR BORING SQUARE HOLES

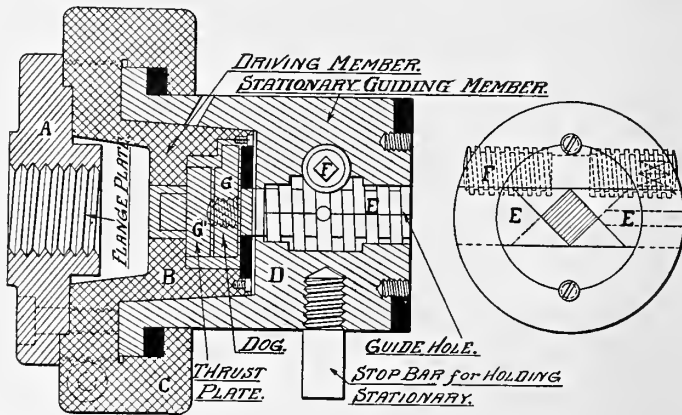
The radical angular drilling apparatus, described and illustrated herewith, is a remarkable and ingenious invention for drilling square or angular holes. This tool is marketed by the Radical Angular Drill Co., 119 W. 23d St., New York City. This device has been introduced successfully in

Germany and is being used by such firms as Frederick Krupp, Siemens & Halske, Schuchardt & Schutte, etc. It is used for rapidly boring or drilling square and angular holes in steel, iron, copper, brass or other metals, wood, stone composition, or any other material on the well-known principle of the Cardan Circles, and it differs from any other method for work of this kind for the fact that it can be easily and rapidly applied to any ordinary milling machine, drill press or lathe without requiring any change in these machines. The apparatus really consists of a specially designed chuck, which moves a three-cornered boring tool or bit about in such a manner that the drill continually changes its position with regard to the center axis of the spindle on which the tool is attached, with the result that the cutting edges of the drill follow a course precisely coinciding with the form of the hole presented by the drill guide. This guide, which in reality consists of two parts, as indicated by letter (e) in the accompanying sectional cut, is adjustable to allow of different sized holes being drilled. The method of working is more of a milling than a drilling process owing to the shape of the drill which is so formed that its under side is sharpened in the manner of a cutter, while the lateral cutting surfaces are hollowed out. This has the advantage that grinding can be easily and rapidly performed on any grinding mill. The chuck is screwed on the spindle of the machine in the same manner as any ordinary chuck. It consists of a guiding part which rides either upon the first part or is secured permanently to the frame of the machine, and a socket into which the shank of the drill is screwed. This socket is caused to rotate, but has a slight freedom of motion in relation to the lathe spindle being guided as to its exact movements by the matrix or frame in the stationary part. Where square holes are to be drilled, the shank of the tool is three-cornered, the sides



The "Radical" Angular Drill Chuck, showing chuck, also some of the three-cornered cutters.





Sectional view of the "Radical" Angular Drill Chuck used for boring square holes: (a) Face plate of a lathe, (b) rotating part of the radical angular drill chuck, attached to the face plate; (c) collar screwed down to (b), serving to retain the stationary part of the chuck (d); (e) intermeshing square guides; (f) screw by means of which they are adjusted; (g) three sockets in which the shank of the tool is screwed and which is driven through a projecting lug on one side from the part (b).

of the shank being formed by segments of circles struck from opposite corners, as centres, the radius of these circles being the same and equal to one of the sides of the square hole, which is to be drilled. The guide in the stationary part of the chuck is adjusted to the size of the hole to be drilled, that is, so that the sides of the square opening are just equal to the radius by which the circles used for striking out the sides of the shank are formed.

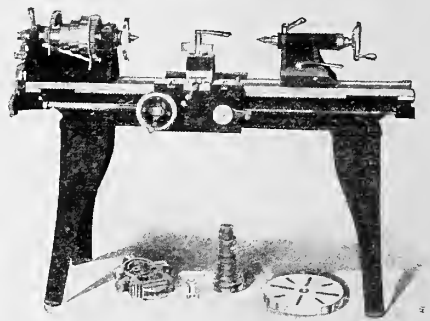
From the accompanying diagram it will be seen that when one of the sides of the shank is either rolling or sliding upon one of the sides of the square guide, the opposite corner of the shank will be moving in a straight line in contact with the opposite side of the guide. The corresponding corner of the head of the tool, would at the same time, strike out a straight line in the work. This motion takes place on all four sides of the guide, except for a little space at each corner, the result being that the hole is perfectly square except for a slight rounding at the corners. If it is desired to bore out a complete square with sharp corners, a special tool is employed, having a shank considerably larger than the head of the tool, one corner of the shank being rounded instead of angular. The exact form of this round shank has to be worked out empirically and a complete set of templates made for the different sizes of tools apt to be required in practice. The outer edges are on the end of the tool, not on the side, being in this respect similar to the ordinary twist or flat drill.

#### SOUTH BEND SCREW CUTTING LATHE

The engine lathe necessary for a garage or small repair shop should be strong, simple and accurate, at the same time reasonable in price, as not many garages will keep a lathe in constant operation. The illus-

tration herewith shows the improved South Bend Screw Cutting Engine Lathe, manufactured by the South Bend Machine Tool Co., South Bend, Ind.

This lathe is the outcome of a great deal of study on the above points, and is reasonable in price because all unnecessary parts and ornamental work that go to make a lathe expensive have been omitted. This



The South Bend Screw Cutting Lathe.

is a complete lathe for the garage and repair shop, capable of taking care of any kind of a job within its capacity that it may be called upon to do. The lathe shown swings  $13\frac{1}{4}$  inches over the bed, is operated by countershaft, will cut thread from 4 to 40, the carriage is provided with "T" slots so that a cylinder may be clamped for boring. The spindle has a  $\frac{3}{4}$ -inch hole through its entire length. The design and construction of the lathe throughout is modern and complete.

The lathe may be also used for wood turning, boring, etc. This company manufactures a complete line of lathes from 8 to 14-inch swing, ranging in length of bed from 3 to 10 feet. They also make and sell a complete line of lathe accessories and tools.



### THE "TOOMEY" LATHE

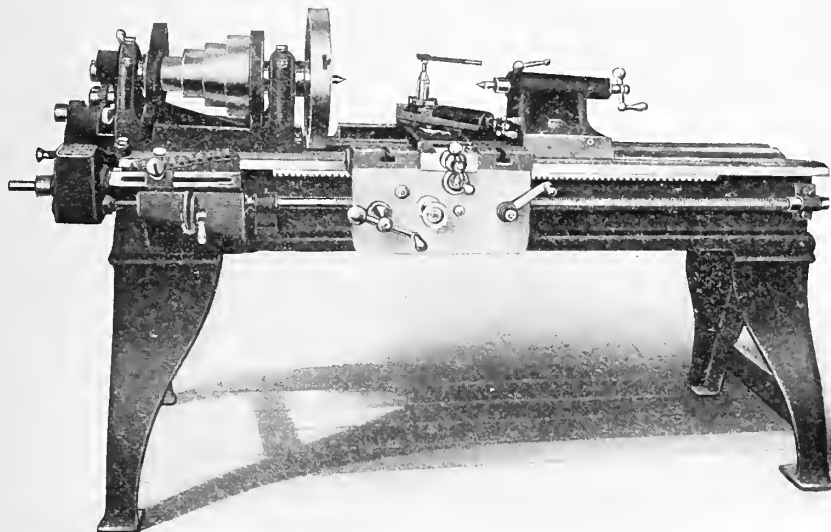
The accompanying cut shows a 14-inch Quick Change Gear Lathe especially designed for the requirements of the automobile trade. It is made by the Carroll-Jamieson Machine Tool Co., of Batavia, O., and is marketed by Frank Toomey, Inc., 127-131 North Third street, Philadelphia, Pa.

This lathe is provided with 30 changes of feeds and threads without the removal of a gear, and is arranged to cut all standard

bearings are phosphor bronze. The carriage has long bearings and is gibbed front and back.

Each machine is tested with a 12-inch test bar and will not exceed .001 inch. Indexed to cut threads per inch from 3 to 32.

With each lathe are furnished large and small face plates, follow rest, steady rest, double friction countershaft and wrenches. Other specifications are as follows: Swings over bed, 14 $\frac{7}{8}$  inches; swings over car-



The "Toomey" 14-inch Quick Change Gear Lathe.

threads from 3 to 32 per inch, including 11 $\frac{1}{2}$  pipe thread, the changes being made instantaneously by moving one handle and a knob, for either right or left-hand feeds.

The construction is very strong and simple, and there is nothing to get out of order, as all gears, where best for the purpose, are steel and the studs are hardened and ground and mounted between two walls. All changes of feeds and threads can be made without stopping the lathe. It is unnecessary for the operator to confine himself to the thread on the index, as other gears can be used on the end of the sliding shaft, and the range of threads and feeds is unlimited.

The cross slide has a wide bearing of 5 $\frac{1}{4}$  inches and is fitted with taper gibbs. The compound rest slide is graduated and of the latest and most approved design. The cross feed is automatic and is graduated as well as the compound rest screw, which is also graduated.

The construction of the apron is simple and strong, has extra long bearing on nut slide. The rack pinion has an end support; the spur gear driving rack pinion is mounted between two walls; the small gears are steel. All studs are hardened and ground; all feeds are friction.

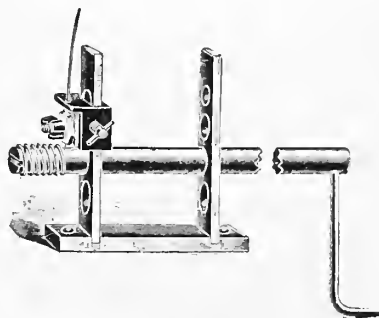
The tail stock is of overhanging style. The feeds are reversed in the head. The

riage, 10 inches; distance between centers, 6-foot bed, 39 inches.

### THE "RITTER" SPRING WINDING MACHINE

This machine is designed for the purpose of coiling springs or re-winding old ones. It will be found to fill a long felt want in any place where there is need of coiling springs such as garages, machine shops, etc. The machine takes up very little room and can be operated by any one.

The desired pitch is given to springs by a brass spacing washer which has five edges, each of different thickness, and also one



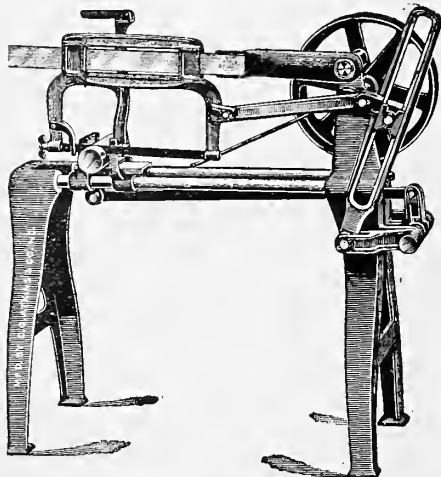
The "Ritter" Spring Winding Machine.

smooth edge, without any flange for use where a closely wound or tension spring is wanted.

It is made in three sizes, as follows: No. 1 machine is supplied with 7 rods as follows:  $\frac{1}{8}$ , 3-16,  $\frac{1}{4}$ , 5-16,  $\frac{3}{8}$ , 7-16,  $\frac{1}{2}$ -inch diameter and will coil springs up to 15 inches long. No. 2 machine is supplied with 5 rods,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ -inch diameter and will coil springs up to 20 inches long. No. 3 machine is supplied with 4 rods,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$ , 1-inch diameter and will coil springs up to 23 inches long. On the large machines the inside diameter of spring will be about  $\frac{1}{8}$  inch larger than diameter of rod it is coiled upon. This machine is marketed by E. W. Chadwick, 130 Centre street, New York City.

#### ATKINS "KWIK KUT" HACK SAW MACHINE

The "Kwik Kut" hack saw machine illustrated herewith is manufactured by E. C. Atkins & Co., Inc., Indianapolis, Ind. This machine is built on strong mechanical lines with all wearing parts large and durable. It is so constructed that the whole saw blade is used in cutting and it automatically adjusts itself to all sizes of cuts. It is called

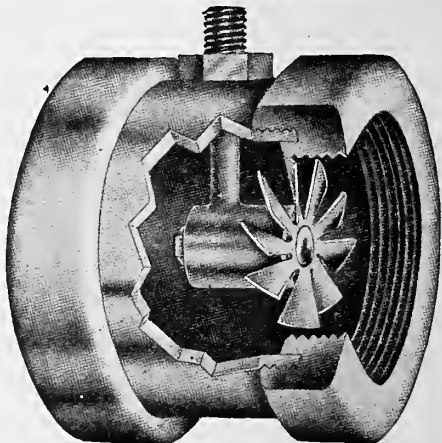


Atkins "Kwik Kut" hack saw machine.

"Kwik Kut" because of the rapid return of the saw arm. The blade has a regular forward motion, but has a return three times as fast, thus saving the time consumed by machines which move forward and backward at the same speed. It has an automatic attachment which throws out the clutch and stops the machine, as soon as the complete cut is made.

The frame is so designed that it may be thrown back if desired, leaving the vice clear. The vice is equipped with a right and left hand screw. The frame is mounted on a flat guide, assuring straight cuts, thus avoiding the breaking of the blades.

#### CYLINDER OILER



### Morgan Auxiliary Oiler and Mixer

**THIS IS IT.** It eliminates all carbon, increases the power of your motor (whether single or double) saves fuel, lengthens the life of your car. What more do you want? Get in line.

**Pioneer Iron Works Co., Antigo, Wis.**

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Wheels—Automobile  
Standard Clincher Rims  
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Special Gaskets of  
Copper, Asbestos and Paper

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Trunks

Lamp Brackets  
Tire Holders  
Foot Pedals  
Foot Rails  
Robe Rails  
Trunk Racks

**We Sell to Automobile Manufacturers and Jobbers Only**

## Section IV—Brand Names

Below we give a list of brand names divided into three groups covering respectively "Automobiles," "Motor Cycles," "Aeronautical" and "General," the last heading including all parts, accessories, machinery, side lines, etc., not included in the other three.

It will be a great benefit to the trade if this list is enlarged to include every brand name in use in this industry. It is also desirable that manufacturers who use no brand names adopt them without delay and have them included in the Brand List of the next number of the Directory, so that every product sold in this industry will have an exclusive trade name by which its producer can be instantly found by reference to this Brand List.

This list reveals the fact that there have been a number of duplications in the selection of brand names, in several cases the same brand name being applied to two or more products of the same kind made by different manufacturers. Such products should be renamed, the manufacturer who has longest used a duplicated brand name retaining it and the others adopting new brand names.

Asterisks (\*) in front of brand names indicate that their manufacture has been discontinued, or that we have been unable to get any response to letters in regard to the continuance of the manufacture of articles.

### Motor Cars

#### A

A. B. C.—gasoline automobile, (pleasure & commercial), A. B. C. Motor Vehicle Mfg. Co., 3915 Morgan St., St. Louis, Mo.  
 A-G—gasoline commercial cars, A-G Truck Co., 43 Exchange Place, New York, N. Y.  
 ABBOTT-DETROIT—gasoline pleasure cars, The Abbott Motor Co., 176 Beaufait Ave., Detroit, Mich.  
 ABRESCH — gasoline commercial cars, Abresch-Cramer Auto Truck Co., 4th & Poplar Sts., Milwaukee, Wis.  
 ACME—gasoline pleasure cars, Acme Motor Car Co., 8th & Elm Sts., Reading, Pa.  
 ACME—gasoline pleasure & commercial cars, Motor Buggy Mfg. Co., 399 S. Third St., Minneapolis, Minn.  
 ACORN—gasoline commercial cars, Acorn Motor Car Co., Cincinnati, O.  
 ADAMS-FARWELL—gasoline cars, The Adams Co., Dubuque, Iowa.  
 ALCO—gasoline pleasure & commercial cars, American Locomobile Co., (Automobile Dept.), 1886 Broadway, N. Y. City.  
 ALDO — gasoline pleasure cars, Albaugh-Dover Co., Marshall Blvd. & 21st St., Chicago, Ill.  
 ALLEN-KINGSTON—gasoline cars, Allen-Kingston Motor Car Co., 3 West 44th St., N. Y. City.  
 \*AMERICAN EAGLE ROADSTER—gasoline pleasure cars, Eagle Automobile Co., Suite 603, Fullerton Bldg., St. Louis, Mo.  
 AMERICAN—electric commercial cars, American Motor Truck Co., Lockport, N. Y.  
 AMERICAN—gasoline pleasure cars, American Motor Car Co., Indianapolis, Ind.  
 AMERICAN—gasoline commercial cars, American Motor Truck Co., Lockport, N. Y.  
 AMERICAN — gasoline commercial cars, American Motor Truck Co., Detroit, Mich.  
 AMERICAN LOCOMOTIVE—gasoline cars, American Locomotive Automobile Co., 1886 Broadway, N. Y. City.  
 AMERICAN SIMPLEX—gasoline cars, Simplex Motor Car Co., Mishawaka, Ind.  
 ANCHOR—gasoline pleasure cars, The Anchor Motor Car Co., South & Summer Sts., Cincinnati, Ohio.  
 ANDERSON—gasoline pleasure and commercial cars, Anderson Carriage Mfg. Co., Anderson, Ind.  
 ANHUT—gasoline pleasure cars, The Anhut Motor Car Co., Detroit, Mich.  
 APPERSON—gasoline cars, Apperson Bros. Auto Co., Kokomo, Ind.  
 ATLAS—gasoline cars, Atlas Motor Car Co., 88 Birnie Ave., Springfield, Mass.  
 AUBURN—gasoline cars, Auburn Automobile Co., Auburn, Ind.

AUSTIN—gasoline automobiles, Austin Automobile Co., 88-92 S. Division St., Grand Rapids, Mich.  
 AUTOCAR—gasoline cars, (pleasure and commercial), Autocar Co., Ardmore, Pa.  
 AUTO-TRI PACKAGE CAR—gasoline commercial cars, Auto-Tri Mfg. Co., 1738 Elmwood Ave. Buffalo, N. Y.  
 AVERY—gasoline commercial cars, Avery Co., Peoria, Ill.

#### B

\*B & B LINE — gasoline cars, Borough & Blood Buggy Co., Marshall, Mich.  
 \*B. G. v. R.—gasoline automobiles, Mercedes Motor Mfg. Co., New Kensington, Pa.  
 BABCOCK—electric cars, Babcock Electric Carriage Co., 226 W. Utica St., Buffalo, N. Y.  
 BABCOCK—gasoline pleasure cars, H. H. Babcock Co., Watertown, N. Y.  
 BADGER—gasoline pleasure cars, Badger Motor Car Co., Columbus, Wis.  
 BAILEY—electric cars, S. R. Bailey & Co., Amesbury, Mass.  
 BAKER—electric cars (pleasure and commercial), The Baker Motor Vehicle Co., Cleveland, O.  
 BARRE—gasoline pleasure cars, imported by French Motor Import Co., 1777 Broadway, Room 216, N. Y. City.  
 BELDEN—gasoline pleasure cars, Belden Motor Car Co., Bessemer Bldg., Pittsburg, Pa.  
 BELMONT—gasoline pleasure cars, Belmont Automobile Mfg. Co., State and Lawrence Sts., New Haven, Conn.  
 \*BENDIX—gasoline motor buggies, The Bendix Co., Cragon Station, Chicago, Ill.  
 \*BENNER SIX—gasoline pleasure cars, Benner Motor Car Co., Motor Mart, N. Y. City.  
 BENZ—gasoline cars, imported by Benz Auto Import Co., of America, 1599-1601 Broadway, N. Y. City.  
 BERGDOLL—gasoline pleasure and commercial cars, Louis J. Bergdoll Co., 31st & Dauphin Sts., Philadelphia, Pa.  
 BERKSHIRE—gasoline pleasure cars, Berkshire Motor Car Co., Renne Ave., Pittsfield, Mass.  
 BERLIET—gasoline pleasure & commercial cars, imported by Albert T. Otto, Motor Mart, 1876 Broadway, N. Y. City.  
 BERTOLET 40—convertible gasoline cars, The Bertolet Motor Car Co., 13 S. 5th St., Reading Pa.

- BILLY FOUR—gasoline pleasure cars, McNab Iron Works, Atlanta, Ga.
- BLACK—gasoline pleasure cars, Black Mfg. Co., 215-219 E. Ohio St., Chicago, Ill.
- BLACK-CROW—gasoline pleasure and commercial cars, Black Mfg. Co., 215-219 E. Ohio St., Chicago, Ill., sales agents (Crow Motor Car Co., Elkhart, Ind., factory).
- BONNER—gasoline cars, C. E. Bonner Mfg. Co., Chrisman, Ill.
- BRASIER—gasoline pleasure cars imported by Flandrau Motor Car Co., 406-412 Broome St., N. Y. City.
- BREEZE—gasoline pleasure and commercial cars, Jewel Carriage Co., Carthage, Ohio.
- BRITISH NAPIER—gasoline pleasure and commercial cars, imported by British Napier Motors, 47 Union Ave., Jamaica Plain, Boston, Mass.
- BROC—electric pleasure cars, The Broc Carriage & Wagon Co., 1665 E. 40th St., Cleveland, Ohio.
- BRODESSER—gasoline commercial cars, P. H. Brodesser & Co., Burleigh & Weil Sts., Milwaukee, Wis.
- BROWNIEKAR—juvenile gasoline auto, Omar Motor Co., 21 Seigrist St., Newark, N. J.
- BRUNNER—gasoline commercial cars, Brunner Motor Car Co., 988 Ellicott St., Buffalo, N. Y.
- BRUSH—gasoline cars, Brush Runabout Co., 14 Baltimore Ave., W., Detroit, Mich.
- BUFFALO—gasoline and electric commercial cars, The Atterbury Motor Car Co., Elmwood & Hertel Aves., Buffalo, N. Y.
- BUGGYCAR—gasoline cars, The Buggycar Co., John St. & Armory Ave., Cincinnati, Ohio.
- \*BUGMOBILE—gasoline pleasure automobiles, Bugmobile Co. of America, 208 Wabash Ave., Chicago, Ill.
- BUICK—gasoline cars, Buick Motor Co., Flint, Mich.
- BURDICK—gasoline cars, Burdick Motor Car Co., Eau Claire, Wis.
- BURDICK GREYHOUND—gasoline cars, Burdick Motor Car Co., Eau Claire, Wis.
- THE BURG—gasoline cars, The L. Burg Carriage Co., Dallas City, Ill.
- \*BYRIDER—electric pleasure cars, Byrider Electric Auto Co., 1948-52 E. 55th St., Cleveland, Ohio.
- C**
- \*C-F—gasoline pleasure cars, Cornish-Friedberg Motor Car Co., 1233 Michigan Ave., Chicago, Ill.
- C. G. V.—gasoline pleasure cars, Imported by C. G. V. Import Co., 49 W. 64th St., N. Y. City.
- \*C. V. I.—gasoline pleasure automobiles, C. V. I. Motor Car Co., Jackson, Mich.
- CADILLAC—gasoline pleasure cars, Cadillac Motor Car Co., 1343 Cass Ave., Detroit, Mich.
- CAMERON—gasoline cars, Cameron Car Co., Beverly, Mass.
- CAPTOL—electric commercial cars, Washington Motor Vehicle Co., Washington, D. C.
- CARHARTT—gasoline pleasure cars, Carhartt Automobile Corporation, 902 Union Trust Bldg., Detroit, Mich.
- CARLSON—gasoline commercial cars, Carlson Motor & Truck Co., Phila., Pa.
- CARTERCAR—gasoline cars (commercial & pleasure), Cartercar Co., Pontiac, Mich.
- CHADWICK—gasoline cars, Chadwick Engineering Works, Pottstown, Pa.
- CHALFANT—gasoline pleasure cars, Chalfant Motor Car Co., Lenover, Pa.
- CHALMERS—gasoline pleasure cars, Chalmers Motor Co., Jefferson Ave. & New Belt Line, Detroit, Mich.
- CHAMPION—electric commercial & gasoline-electric commercial cars, Champion Wagon Co., Owego, N. Y.
- \*CHAMPION—gasoline pleasure cars, Famous Mfg. Co., East Chicago, Ind.
- CHAMPION—gasoline commercial cars, C. F. Megow Co., S. Milwaukee, Wis.
- CHASE—gasoline pleasure and commercial cars, Chase Motor Truck Co., 332 S. West St., Syracuse, N. Y.
- CINO—gasoline pleasure cars, Haberer & Co., Gest, Evans, Berlin & Summer Sts., Cincinnati, O.
- CLARK—gasoline commercial cars, A. C. Clark & Co., Grand Crossing, Chicago, Ill.
- CLARK—gasoline pleasure and commercial cars, Clark Motor Car Co., Shelbyville, Ind.
- CLARK—gasoline pleasure & commercial cars, Clark & Co., Lansing, Mich.
- CLARK—steam automobiles, Edward S. Clark, 272-278 Freeport St., Boston, Mass.
- \*CLARK—gasoline pleasure & commercial cars to order, Clark Automobile Co., 1201-11 Main St., Anderson, Ind.
- CLARK-HATFIELD—gasoline pleasure and commercial cars, Clark-Hatfield Auto Co., Oshkosh, Wis.
- CLEMENT-BAYARD—gasoline pleasure cars, imported by Sidney B. Bowman Automobile Co., 225-231 W. 49th St., N. Y. City.
- \*CLEVELAND—gasoline pleasure cars, Cleveland Motor Car Co., 1659 Broadway, N. Y. City.
- COATES-GOSHEN—gasoline pleasure cars, Coates-Goshen Automobile Co., Goshen, N. Y.
- COLBURN—gasoline pleasure cars, The Colburn Automobile Co., 15th St. and West Colfax Ave., Denver, Colo.
- COLE—gasoline cars, Cole Motor Car Co., Indianapolis, Ind.
- COLUMBIA—gasoline & electric pleasure cars, The Columbia Motor Car Co., Hartford, Conn.
- COLUMBUS—electric pleasure cars, Columbus Buggy Co., Columbus, O.
- \*CONTINENTAL—gasoline pleasure cars, The Continental Auto Mfg. Co., 121-23 Olive St., New Haven, Conn.
- COPPOCK—gasoline commercial cars, Decatur Motor Car Co., Decatur, Ill.
- CORBIN—gasoline cars, Corbin Motor Vehicle Corp., New Britain, Conn.
- CORREJA—gasoline cars, Vandewater & Co., 71-79 Prince St., Elizabeth, N. J.
- CORTLAND—gasoline commercial cars, Cortland Wagon Co., Cortland, N. Y.
- \*COSMOPOLITAN—gasoline cars, D. W. Haydock Automobile Mfg. Co., St. Louis, Mo.
- COUPLE-GEAR—electric pleasure cars, The Church Balance Gear Co., Grand Rapids, Mich.
- \*COYOTE—gasoline pleasure cars, Union Automobile Co., Albany, Ind.
- CRAWFORD—gasoline cars, Crawford Automobile Co., Hagerstown, Md.
- CROWN—gasoline pleasure cars, Graves & Congdon Co., Carriage Ave., Amesbury, Mass.
- CROXTON-KEETON—gasoline commercial cars, The Kroxtion-Keeton Motor Co., Massillon, Ohio.
- CUTTING—gasoline pleasure cars, Clarke Carter Automobile Co., Jackson, Mich.
- D**
- D-P—Duplex-Power Car Co., 401-425 Lovett St., Charlotte, Mich.
- DARBY—gasoline pleasure & commercial cars, Darby Motor Car Co., 530 DeBaliviere Ave., St. Louis, Mo.
- DEDION-BOUTON—gasoline pleasure and commercial cars, imported by DeDion-Bouton Selling Branch, 1649 Broadway, N. Y. City.
- DEMOT—gasoline pleasure cars, Demotcar Co., 1305 Bellevue Ave., Detroit, Mich.
- DERAIN—gasoline cars, The Derain Motor Co., 7500 Quincy Ave., Cleveland, Ohio.

DE SCHAUM BUFFALOES—gasoline pleasure & commercial cars, De Schaum Motor Syndicate Co., 316 Prudential Bldg., Buffalo, N. Y.

DESHAW—gasoline pleasure cars, DeShaw Motor Co., 50-54 Summerfield St., Evergreen, L. I., N. Y.

DE TAMBLE—gasoline pleasure cars, De Tamble Motors Co., Anderson, Ind.

DETROIT—electric cars, Anderson Carriage Co., Detroit, Mich.

DIAMOND—gasoline pleasure cars, The Diamond Automobile Co., South Bend, Ind.

DIAMOND T—gasoline cars, Diamond T Motor Car Co., 3 E. Huron St., Chicago, Ill.

\*DIXIE—gasoline pleasure cars, Southern Motor Car Factory, Houston, Texas.

\*DOE-WAH-JACK—gasoline pleasure and commercial cars, Dowagiac Motor Car Co., Dowagiac, Mich.

DORRIS—gasoline cars, Dorris Motor Car Co., 22-38 S. Sarah St., St. Louis, Mo.

DUER—gasoline cars, Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.

DUPLEX—gasoline pleasure cars, Duplex Motor Car Co., 11400 Michigan Ave., Roseland, Chicago, Ill.

DUROCAR—gasoline cars, The Durocar Mfg. Co., 927-935 Los Angeles St., Los Angeles, Cal.

DURYEA—gasoline commercial cars, Chas. E. Duryea, Reading, Pa.

DURYEA BUGGYAUT—gasoline cars, Chas. E. Duryea, Reading, Pa.

## E

E-M-F—Gasoline pleasure cars, Everitt-Metzger Flanders Co., Detroit, Mich.

ELITE—gasoline pleasure cars, Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.

ELMORE—gasoline cars, Elmore Mfg. Co., 1004 Amanda St., Clyde, Ohio.

EMBREE-McLEAN—gasoline pleasure cars, Embree-McLean Carriage Co., 1813-23 Olive St., St. Louis, Mo.

EMPIRE—gasoline pleasure cars, Empire Motor Car Co., Indianapolis, Ind.

ENGER—gasoline pleasure cars, The Enger Motor Car Co., Gest St. & C. H. & D. R. R. Crossing, Cincinnati, O.

ETNYRE—gasoline cars, Etnyre Motor Car Co., Oregon, Ill.

EUREKA—gasoline pleasure and commercial cars, Eureka Motor Mfg. Co., Inc., 3025-29 Olive St., St. Louis, Mo.

EVERITT—gasoline pleasure cars, Metzger Motor Car Co., Detroit, Mich.

EWING—gasoline commercial cars, The Ewing Automobile Co., Geneva, Ohio.

EXPRESS—gasoline pleasure cars, Johnson Service Co., Michigan & Jeffersons Sts., Milwaukee, Wis.

## F

\*FAIRBANKS-MORSE—gasoline cars (commercial), Fairbanks, Morse & Co., Chicago, Ill.

FAL-CAR—gasoline pleasure and commercial cars, Fal-Motor Co., 171 N. May St., Chicago, Ill.

FALCON—gasoline pleasure cars, Larsen Ice Machine Co., 1832 Arlington Place, Chicago, Ill.

FEDERAL—gasoline cars, Rockford Automobile & Engine Co., Talcott Bldg., Rockford, Ill.

FEDERAL—gasoline pleasure & commercial cars, Industrial Automobile Co., Elkhart, Ind.

FIAT—gasoline pleasure cars, imported by Fiat Automobile Co., 1786 Broadway, N. Y. City.

FIELD—gasoline pleasure cars, Field Automobile Mfg. Co., 241-245 N. Ninth St., Lincoln, Nebr.

FIRESTONE-COLUMBUS—gasoline pleasure cars, Columbus Buggy Co., Columbus, O.

FLANDERS—gasoline pleasure cars, Everitt-Metzger-Flanders Co., Detroit, Mich.

FORD—gasoline pleasure and commercial cars, Ford Motor Co., 254 Piquette Ave., Detroit, Mich.

FRANKLIN—gasoline cars, H. H. Franklin Mfg. Co., 402 S. Geddes St., Syracuse, N. Y.

FRAYER-MILLER—gasoline commercial cars, Oscar Lear Automobile Co., Springfield, O.

FRITCHEL—electric pleasure automobiles, The Fritchle Automobile & Battery Co., 1510-30 Clarkson St., Denver, Colo.

FRONTENAC—gasoline cars, (pleasure & commercial), Abendroth & Root Mfg. Co., 320 Fifth Ave., N. Y. City.

FULLER—gasoline cars, Angus Automobile Co., Angus, Neb.

## G

GABRIEL—gasoline pleasure cars, The Gabriel Auto Co., Cleveland, Ohio.

GAETH—gasoline cars, Gaeth Automobile Co., 2553 W. 25th St., Cleveland, Ohio.

GALE—gasoline cars, Robson Mfg. Co., Galesburg, Ill.

\*GARY—gasoline commercial cars, Gary Taxicab Co., 1256 Michigan Ave., Chicago, Ill.

GLEASON—gasoline cars, Kansas City Vehicle Co., 2nd & Main Sts., Kansas City, Mo.

GLIDE—gasoline cars, Bartholomew Co., 210 Glide St., Peoria, Ill.

GOPHER—gasoline commercial cars, Robinson-Loomis Motor Truck Co., Minneapolis, Minn.

GRABOWSKY—gasoline cars (commercial), Grabowsky Power Wagon Co., 68-72 Champlain St., Detroit, Mich.

GRAMM-LOGAN—gasoline commercial automobiles, Gramm-Logan Motor Car Co., Bowling Green, Ohio.

GREAT CHADWICK SIX—gasoline cars, Chadwick Engineering Works, Pottstown, Pa.

GREAT EAGLE—gasoline pleasure cars, United States Carriage Co., Columbus, O.

GREAT SMITH—gasoline cars, Smith Auto Co., 10th & Jefferson Sts., Topeka, Kans.

GREAT WESTERN—gasoline cars, Great Western Automobile Co., Peru, Ind.

GREGOIRE—gasoline pleasure cars, imported by French Motor Import Co., 1777 Broadway, Room 216, N. Y. City.

GROUT—gasoline cars, Grout Auto Co., Orange, Mass.

GYROSCOPE—gasoline cars, Gyroscope Automobile Co., Inc., Gyroscope Bldg., 231 W. 54th St., N. Y. City.

## H

HALLIDAY—gasoline cars, Streator Motor Car Co., Streator, Ill.

HART-KRAFT—gasoline commercial cars, Hart-Kraft Motor Co., York, Pa.

\*HAY-BERG—gasoline pleasure cars, Hay-Berg Motor Car Co., Milwaukee, Wis.

HAYNES—gasoline cars, The Haynes Automobile Co., Kokomo, Ind.

HERRESHOFF—gasoline pleasure cars, Herreshoff Motor Co., Harper & Dequindre Sts., Detroit, Mich.

HOBBIÉ—gasoline cars, Hobbie Automobile Co., Hampton, Iowa.  
 HOLMES—gasoline pleasure cars, Chas. Holmes Machine Co., Cambridgeport, Mass.  
 HOLSMAN—gasoline cars, Holtsman Automobile Co., 444 Monadnock Bldg., Chicago, Ill.  
 HOTCHKISS—gasoline pleasure cars, Hotchkiss Import Co., 20 W. 60th St., N. Y. City.  
 HOUP—gasoline pleasure cars, Harry S. Houpt, 2004 Broadway, N. Y. City.  
 HUDSON—gasoline pleasure cars, Hudson Motor Car Co., Detroit, Mich.  
 HUPMOBILE—gasoline pleasure cars, Hupp Motor Car Co., cor. Jefferson & Concord Aves., Detroit, Mich.

## I

IDEAL—electric pleasure cars, Ideal Electric Co., 444 W. Indiana St., Chicago, Ill.  
 IDEAL—gasoline commercial cars, Ideal Mfg. Co., Portsmouth, Ohio.  
 ILLINOIS—gasoline pleasure cars, The Overholt Co., Galesburg, Ill.  
 IMPERIAL—gasoline pleasure cars, Imperial Automobile Co., Jackson, Mich.  
 INTERNATIONAL AUTO BUGGY—gasoline cars, International Harvester Co. of America, 7 Monroe St., Chicago, Ill.  
 INTERNATIONAL AUTO WAGON—gasoline commercial cars, International Harvester Company of America, 7 Monroe St., Chicago, Ill.  
 INTERNATIONAL—gasoline cars, (commercial), International Motor Car Co., 514-16 N. Broad St., Phila., Pa.  
 \*INTERNATIONAL—gasoline pleasure cars, International Automobile Co., 1245 Wabash Ave., Chicago, Ill.  
 INTER-STATE—gasoline cars, Inter-State Automobile Co., Muncie, Ind.  
 INVINCIBLE SCHACHT—gasoline pleasure cars, Schacht Mfg. Co., 2727 Spring Grove Ave., Cincinnati, O.

## J

JACKSON—gasoline cars, Jackson Automobile Co., Jackson, Mich.  
 THE JAMES—gasoline pleasure cars, J. & M. Motor Car Co., Lawrenceburg, Ind.  
 JOHNSON—steam & gasoline cars, (pleasure & commercial), Johnson Service Co., Milwaukee, Wis.  
 JONZ—gasoline pleasure cars, Jonz Automobile Co., Beatrice, Neb.

## K

KATO 4-DRIVE—gasoline pleasure & commercial cars, The Four Traction Auto Co., Mankato, Minn.  
 \*KAUFFMAN—gasoline pleasure cars, Advance Motor Vehicle Co., Miamisburg, O.  
 KEARNS—gasoline cars, Kearns Motor Car Co., Beavertown, Pa.  
 KENMORE—gasoline pleasure cars, Kenmore Mfg. Co., 324 Gaff Bldg., Chicago, Ill.  
 KEYSTONE—gasoline & Electric pleasure & commercial vehicles, Standard G. E. Power Co., cor. 50th & Lancaster Ave., Philadelphia, Pa.  
 KEYSTONE SIX—gasoline pleasure cars, The Munch Motor Car Co., DuBois, Pa.  
 KISSEL KAR—gasoline pleasure cars, Kissel Motor Car Co., Hartford, Wis.  
 KLINE KAR—gasoline pleasure and commercial cars, B. C. K. Motor Car Co., York, Pa.  
 KLINK—gasoline cars, Klink Motor Car Mfg. Co., Dansville, N. Y.

KNOX—gasoline cars, (pleasure & commercial), Knox Automobile Co., Wilbraham Road, Springfield, Mass.  
 KOEHLER 40—gasoline pleasure cars, H. J. Koehler Co., 1709 Broadway, N. Y. City.

## L

LA BUIRE—gasoline cars, imported by La Buire Import Co., 1964 Broadway, N. Y. City.  
 LAMBERT—gasoline commercial cars, Lambert Motor Truck Co., Anderson, Ind.  
 LAMBERT—gasoline pleasure & commercial cars, Buckeye Mfg. Co., Anderson, Ind.  
 LANCIA—gasoline cars, imported by Hol-Tan Co., 1741 Broadway, N. Y. City.  
 LANE—steam cars, Lane Motor Vehicle Co., Poughkeepsie, N. Y.  
 LANPHER—gasoline pleasure & commercial cars, Lanpher Motor Buggy Co., Carthage, Mo.  
 LANDSDEN—electric pleasure & commercial cars, The Landsden Co., 54 Lackawanna St., Newark, N. J.  
 \*LAWTER—gasoline pleasure cars, Safety Shredder Co., Newcastle, Ind.  
 LEADER—gasoline cars, Columbia Electric Co., Knightstown, Ind.  
 LEIST—gasoline pleasure cars, Leist Automobile Mfg. Co., Michigan City, Ind.  
 LENDE—gasoline cars, (pleasure & commercial), Lende Automobile Mfg. Co., 617 Guaranty Bldg., Minneapolis, Minn.  
 LEXINGTON—gasoline pleasure cars, The Lexington Motor Car Co., Inc., Lexington, Ky.  
 LINCOLN—gasoline cars, Lincoln Motor Vehicle Co., Lincoln, Ill.  
 LION—gasoline pleasure cars, Lion Motor Car Co., Adrian, Mich.  
 LOCOMOBILE—gasoline pleasure cars, Locomobile Co. of America, Bridgeport, Conn.  
 LOZIER—gasoline cars, Lozier Motor Co., Broadway, Cor. 56th St., N. Y. City.  
 LUITWEILER—gasoline automobile fire engines, Luitweiler Pumping Engine Co., 123 Ames St., Rochester, N. Y.  
 LUVERNE—gasoline cars, Luverne Automobile Co., Luverne, Minn.

## M

MMC—gasoline pleasure & commercial cars, Manlius Motor Co., Manlius, N. Y.  
 McCREA—gasoline commercial cars, The McCreA Motor Truck Co., Cleveland, O.  
 McCUE HARTFORD—gasoline pleasure vehicles, The McCue Co., Hartford, Conn.  
 McFARLAN SIX—gasoline pleasure cars, McFarlan Motor Car Co., Connersville, Ind.  
 MCINTYRE—gasoline pleasure and commercial cars, W. H. McIntyre Co., Auburn, Ind.  
 MAIS—gasoline commercial cars, The Mais Motor Truck Co., Peru, Ind.  
 MAJESTIC—gasoline cars, Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis.  
 MANHATTAN—gasoline cars, (commercial), Mack Bros. Motor Car Co., Allentown, Pa.  
 \*MAPLEBAY—gasoline pleasure cars, The Maplebay Mfg. Co., Crookston, Minn.  
 \*MARATHON—gasoline pleasure cars, The Marathon Motor Car Co., 2935-41 Spring Grove Ave., Cincinnati, Ohio.  
 MARATHON—gasoline pleasure cars, Southern Motor Works, 341-349 N. Royal St., Jackson, Tenn.  
 MARION—gasoline automobile, Marion Automobile & Mfg. Co., Indianapolis, Ind.  
 MARMON—gasoline pleasure cars, Nordyke & Marmon Co., Morris St. & Ky. Ave., Automobile Dept., Indianapolis, Ind.  
 MARYLAND—gasoline cars, Sinclair-Scott Co., Wells & Patapsco Sts., Baltimore, Md.

MASON—gasoline pleasure cars, Maytag-Mason Motor Co., Waterloo, Iowa.  
 MATHESON—gasoline pleasure cars, Matheson Automobile Co., 1886-88 Broadway, N. Y. City.  
 MAYTAG—gasoline pleasure cars, Maytag-Mason Motor Co., Waterloo, Iowa.  
 MEISELBACH—gasoline commercial cars, Meiselbach Mfg. Co., North Milwaukee, Wis.  
 \*MENGENS—gasoline pleasure cars, The Menges Auto Co., Elkhart, Ind.  
 MERCER—gasoline pleasure cars, Mercer Automobile Co., 52 Church St., Boston, Mass.  
 METZ PLAN—gasoline cars (pleasure & com.) The Metz Co., Waltham, Mass.  
 MICHIGAN SIX—gasoline pleasure cars, Michigan Motor Car Mfg. Co., Ltd., 730 Penobscot Bldg., Detroit, Mich.  
 MIDDLEBY—gasoline cars, Middleby Automobile Co., N. River St., Reading, Pa.  
 MIDLAND—gasoline cars, Midland Motor Co., Moline, Ill.  
 MIER—gasoline cars, Mier Carriage & Buggy Co., Ligonier, Ind.  
 MITCHELL—gasoline pleasure & commercial cars, Mitchell-Lewis Motor Co., Racine, Wis.  
 MOLINE—gasoline cars, Moline Automobile Co., East Moline, Ill.  
 MONITOR—gasoline pleasure and commercial cars, Monitor Automobile Works, 315 Dearborn St., Chicago, Ill.  
 MONSEN—commercial pleasure cars, A. Monsen, 329 N. Clark St., Chicago, Ill.  
 MOON—gasoline cars, Moon Motor Car Co., Main & Cornelia Sts., St. Louis, Mo.  
 MORA—gasoline pleasure cars, Mora Company, 17 Mora Place, Newark, N. Y.  
 MORSE—gasoline pleasure cars, Easton Machine Co., S. Easton, Mass.  
 MUNISING—gasoline commercial cars & taxicabs, Munising Motor Car Co., Hoboken, N. J.

## N

NATIONAL—gasoline cars, National Motor Vehicle Co., 1003 E. 22nd St., Indianapolis, Ind.  
 NEVILLE—gasoline cars, ambulances & hotel coaches, T. Neville, Oshkosh, Wis.

## O

OAKLAND—gasoline pleasure cars, Oakland Motor Car Co., Pontiac, Mich.  
 OHIO—electric pleasure cars, The Ohio Electric Carriage Co., Toledo, O.  
 OHIO—gasoline pleasure cars, The Ohio Motor Car Co., Carthage, O.  
 OLDSMOBILE—gasoline cars, Olds Motor Works, Lansing, Mich.  
 ONLY—gasoline pleasure cars, The Only Car Co., Port Jefferson, N. Y.  
 OTTO—gasoline pleasure cars, The Otto Gas Engine Works, 33rd & Walnut Sts., Phila., Pa.  
 OVERLAND—gasoline cars, Willys-Overland Co., Toledo, O.

## P

PACKARD—gasoline cars, (pleasure & commercial), Packard Motor Car Co., Boulevard & Belt Line, Detroit, Mich.  
 PAIGE-DETROIT—gasoline pleasure cars, Paige-Detroit Motor Car Co., 224-253 21st St., Detroit, Mich.  
 PALMER-SINGER—gasoline pleasure cars, Palmer & Singer Mfg. Co., 1618-1620 Broadway, N. Y. City.

PANHARD & LEVASSOR—gasoline pleasure cars, imported by Panhard & Levassor, Broadway & 62nd St., N. Y. City.  
 PANTHER—gasoline pleasure cars, Panther Car Co., 100 Boylston St., Boston, Mass.  
 PARRY—gasoline pleasure cars, Parry Auto Co., Indianapolis, Ind.  
 PATERSON—gasoline cars, W. A. Paterson Motor Car Co., S. W. cor. 3rd & Harrison Sts., Flint, Mich.  
 PEERLESS—gasoline pleasure cars, Peerless Motor Car Co., Quincy Ave. & E. 93rd St., Cleveland, O.  
 PENNSYLVANIA—gasoline pleasure cars, Pennsylvania Auto-Motor Co., Bryn Mawr, Pa.  
 \*PHIPPS JOHNSON—electric cars, Auto Engineering Co., 46 Bagge St., Detroit, Mich.  
 PHOENIX—gasoline commercial cars, Phoenix Auto Works, 366 Bridge St., Phoenixville, Pa.  
 PICKARD—gasoline car, Pickard Bros., 8-14 Foundry St., Brockton, Mass.  
 PIERCE-ARROW—gasoline pleasure cars, The Pierce-Arrow Motor Car Co., 1695 Elmwood Ave., Buffalo, N. Y.  
 PIERCE-RACINE—gasoline cars, The Pierce Motor Co., Racine, Wis.  
 PIGGINS—gasoline cars, Piggins Bros., Racine, Wis.  
 PIRATE—gasoline pleasure cars, The G. J. G. Motor Car Co., White Plains, N. Y.  
 PITTSBURGH—gasoline commercial cars, Parr Wagon Co., 2124 Penn Ave., Pittsburgh, Pa.  
 THE PITTSBURGH—electric commercial cars, Pittsburgh Motor Vehicle Co., 5722 Ellsworth Ave., Pittsburgh, Pa.  
 PITTSBURGH SIX—gasoline pleasure cars, Fort Pitt Motor Mfg. Co., Pittsburgh, Pa.  
 PLYMOUTH—gasoline pleasure & commercial cars, Plymouth Motor Truck Co., Plymouth, O.  
 POPE-HARTFORD—gasoline cars, The Pope Mfg. Co., Hartford, Conn.  
 POPE-TOLEDO—gasoline cars—Pope Motor Car Co., Toledo, O.  
 POPE-TRIBUNE—gasoline cars, The Pope Mfg. Co., Hartford, Conn.  
 POWERCAR—gasoline pleasure cars, The Powercar Auto Co., York, Central Ave. & Linneaus St., Cincinnati, O.  
 PRATT-ELKHART—gasoline & electric pleasure cars, Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind.  
 PREMIER—gasoline cars, Premier Motor Mfg. Co., Georgia & Shelby Sts., Indianapolis, Ind.  
 \*PRODAL—gasoline pleasure & commercial cars, The Motor Car Repair Co., 509-515 W. 56th St., N. Y. City.  
 PULLMAN—gasoline pleasure cars, Pullman Motor Car Co., York City, Pa.  
 PUNGS-FINCH—gasoline pleasure cars, Pungs-Finch Auto & Gas Engine Co., 1524 Jefferson Ave., Detroit, Mich.

## R

R. A. C.—gasoline pleasure cars, The Diamond Automobile Co., South Bend, Ind.  
 RAINIER—gasoline cars, Rainier Motor Co., 1920 Broadway, N. Y. City.  
 RAMBLER—gasoline cars, Thos. B. Jeffery & Co., Kenosha, Wis.  
 RANDOLPH—gasoline commercial cars, Randolph Motor Car Co., 175 E. Randolph St., Chicago, Ill.  
 RANGER—gasoline pleasure cars, Ranger Automobile Co., 1224-41 E. 46th St., Chicago, Ill.  
 RAPID—gasoline commercial cars, Rapid Motor Vehicle Co., Pontiac, Mich.  
 RAUCH & LANG—electric pleasure cars, The Rauch & Lang Carriage Co., 631 Superior St., Cleveland, O.  
 REGAL—gasoline cars, Regal Motor Car Co., Beaubien & Trombley Ave., Detroit, Mich.  
 RELIANCE—gasoline commercial cars, Reliance Motor Truck Co., Owosso, Mich.



RELIANCE—gasoline commercial cars, Robinson-Loomis Motor Truck Co., Minneapolis, Minn.  
 RENAULT—gasoline pleasure cars, imported by Renault Freres Selling Branch, 1776 Broadway, N. Y. City.  
 REO—gasoline pleasure cars, Reo Motor Car Co., Lansing, Mich.  
 REPUBLIC—gasoline pleasure cars, The Republic Motor Car Co., Hamilton, Ohio.  
 RICHMOND—gasoline automobiles, Wayne Works, Richmond, Ind.  
 \*RICKETTS SIX—gasoline pleasure cars, Ricketts Automobile Works, South Bend, Ind.  
 RIDER-LEWIS—gasoline automobiles, The Rider-Lewis Motor Car Co., Anderson Ind.  
 ROCKWELL—taxicabs, New Departure Mfg. Co., Bristol, Conn.  
 ROSS—steam pleasure cars, Louis S. Ross, Crafts St., Newtonville, Mass.  
 ROYAL TOURIST—gasoline cars, Royal Tourist Car Co., Gordon Park Blvd., L. S. & M. S. Ry., Cleveland, O.

## S

S. C. A. T.—gasoline pleasure cars, imported by Leighton Auto Co., Brockton, Mass.  
 S. P. A.—gasoline pleasure cars, imported by Cesare Conti, 35-37 Broadway, N. Y. City.  
 S. P. O.—cars, imported by S. P. O. Automobile Co., 1595 Broadway, New York City, N. Y.  
 SALTER—gasoline pleasure cars, The W. A. Salter Motor Co., 1516-20 Oakland Ave., Kansas City, Mo.  
 SAMPSON—gasoline commercial cars, Alden Sampson Mfg. Co., Pittsfield, Mass.  
 SAURER—gasoline commercial cars, Saurer Motor Truck Co., 400 W. Randolph St., Chicago, Ill.  
 SAYERS & SCOVILLE—gasoline commercial cars, The Sayers & Scoville Co., Cincinnati, O.  
 SCHMIDT F. C. S.—gasoline commercial cars, Schmidt Bros. Co., 7100 S. Chicago Ave., Chicago, Ill.  
 SCHURMEIER—gasoline pleasure cars, The Schurmeier Motor Car Co., 29 Western Ave., Minneapolis, Minn.  
 SCOUT—gasoline pleasure cars, the G. J. G. Motor Car Co., White Plains, N. Y.  
 SEARS—gasoline pleasure cars, Sears, Roebuck & Co., Homan & Harvard Aves., Chicago, Ill.  
 SEBRING SIX—gasoline pleasure cars, The Sebring Motor Car Co., Sebring, O.  
 SELDEN—gasoline pleasure cars, Selden Motor Vehicle Co., Rochester, N. Y.  
 SENATOR—gasoline cars, Victor Automobile Co., Ridgeville, Ind.  
 SHARP ARROW—gasoline cars, Sharp Arrow Automobile Co., 942 S. Clinton Ave., Trenton, N. J.  
 SILENT KNIGHT—gasoline cars, Knight & Kilbourne, 1238-1240 Michigan Ave., Chicago, Ill.  
 SIMPLEX—gasoline pleasure cars, Simplex Automobile Co., Inc., 614 E. 83rd St., N. Y.  
 SIMPLICITY—gasoline cars, Evansville Automobile Co., Evansville, Ind.  
 \*SOULES—gasoline commercial cars, Anthony-Hatcher Co., Grand Rapids, Mich.  
 SPAULDING—gasoline pleasure cars, Spaulding Mfg. Co., Grinnell, Iowa.  
 SPECIAL—gasoline pleasure cars, Johnson Service Co., Michigan & Jefferson Sts., Milwaukee, Wis.  
 SPEEDWELL—gasoline pleasure and commercial cars, Speedwell Motor Car Co., Dayton, Ohio.  
 SPRINGFIELD—gasoline pleasure cars, The Springfield Motor Car Co., Springfield, Ill.  
 STAFFORD—gasoline pleasure cars, Stafford Motor Car Co., Kansas City, Mo.  
 STANDARD—gasoline & electric commercial & pleasure cars, Standard G. E. Power Co., cor. 50th & Lancaster Ave., Philadelphia, Pa.

STANDARD—gasoline pleasure cars, St. Louis Car Co., 5201 N. 2nd St., St. Louis, Mo.  
 STANLEY—steam automobiles, Stanley Motor Carriage Co., Newton, Mass.  
 STARR—gasoline pleasure cars, Starr Motor Car Co., 522-524 S. 10th St., Minneapolis, Minn.  
 STAYER-CHICAGO—gasoline pleasure cars, Stayer Carriage Co., 76th & Wallace Sts., Auburn Park, Ill.  
 STEARNS—gasoline cars, The F. B. Stearns Co., Euclid Ave. & Lakeview, Cleveland, Ohio.  
 STERLING—gasoline cars, Elkhart Motor Car Co., Elkhart, Ind.  
 STERLING—gasoline commercial cars, The Sterling Vehicle Co., Harvey, Ill.  
 STERNBERG—gasoline commercial automobiles, Sternberg Mfg. Co., Milwaukee, Wis.  
 STEVENS-DURYEA—gasoline cars, Stevens-Duryea Co., 700 Main St., Chicopee Falls, Mass.  
 STODDARD-DAYTON—gasoline cars, Dayton Motor Car Co., Dayton, Ohio.  
 STORM QUEEN—doctor's storm car, Kearns Motor Buggy Co., Beavertown, Pa.  
 STUDEBAKER, STUDEBAKER-FLANDERS & STUDEBAKER E-M-F—gasoline and electric cars, Studebaker Automobile Co., South Bend, Ind.  
 SUCCESS—Gasoline automobiles, Success Auto-Buggy Mfg. Co., 532-36 DeBallveere Ave., St. Louis, Mo.  
 SULTAN—gasoline pleasure & commercial cars, Sultan Motor Co., 1659 Broadway N. Y. City.

## T

THOMAS—gasoline commercial cars (taxicabs), Thomas Motor Cab Co., 1738 Elmwood Ave., Buffalo, N. Y.  
 THOMAS FLYERS—gasoline cars, E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y.  
 TORBENSEN—gasoline commercial cars, Torbensen Motor Car Co., 610 Bloomfield Ave., Bloomfield, N. J.  
 TRAVELLER—gasoline pleasure cars, Traveller Automobile Co., Evansville, Ind.  
 TRIUMPH—gasoline pleasure and commercial cars, Christopher Bros., 3308 Sheffield Ave., Chicago, Ill.  
 \*TROJAN—gasoline pleasure cars, Trojan Motor Co., Louisville, Ky.

## U

\*ULTRA—electric pleasure cars, Auto Engineering Co., 46 Baggs St., Detroit, Mich.  
 UTILITY—gasoline pleasure & commercial cars, Stephenson Motor Car Co., 188 8th St., Milwaukee, Wis.

## V

VAN—gasoline commercial & pleasure cars, H. F. Van Wambeke & Sons, Elgin, Ill.  
 VAN DYKE—gasoline commercial cars, Van Dyke Motor Car Co., 1221 Ford Bldg., Detroit, Mich.  
 VAUGHN—gasoline commercial cars, Whitesides Wheel Co., West 10th & Canal Sts., Indianapolis, Ind.  
 VEERAC—gasoline pleasure & commercial cars, Veerac Motor Co., 529-31 Metropolitan Bldg., Minneapolis, Minn.  
 VELIE—gasoline cars, Velie Motor Vehicle Co., Moline, Ill.  
 VICKERS—gasoline pleasure cars, The Vickers Motor Car Co., Coshocton, O.

## W

- WALKER—Electric commercial cars, The Automobile Maintenance & Mfg. Co., 213-219 S. Green St., Chicago, Ill.
- WARREN-DETROIT—gasoline pleasure cars, The Warren Motor Car Co., Detroit, Mich.
- WATT—gasoline pleasure cars, Watt Motor Co., 564 Porter St., Detroit, Mich.
- WAVERLY—electric, (pleasure & commercial cars), The Waverly Co., 139 South East St., Indianapolis, Ind.
- WEBB—fire engines, chemical engines, comb. fire & hose wagons, chief's runabouts, etc., Webb Motor Fire Apparatus Co., Vincennes, Ind.
- WELCH—gasoline pleasure cars, Welch Company of Detroit, 1302-18 Jefferson Ave., E., Detroit, Mich.
- WELCH-DETROIT—gasoline pleasure cars, Welch Company of Detroit, 1302-18 Jefferson Ave., E., Detroit, Mich.
- WEYHER—gasoline commercial cars, The Weyher Mfg. Co., Whitewater, Wis.
- WHITE—gasoline pleasure cars, Waltham Mfg. Co., Waltham Mass.

- WHITE (GEORGE)—gasoline pleasure cars, The Geo. White Buggy Co., Rock Island, Ill.
- WHITE—steam & gasoline pleasure & commercial cars & steam commercial cars, The White Co., Rose Bldg., Cleveland, O.
- WHITE STAR—gasoline pleasure & commercial cars, Atlanta Motor Car Co., Atlanta, Ga.
- WHITING—gasoline pleasure cars, Flint Wagon Works, Flint, Mich.
- WILCOX—gasoline commercial & pleasure cars, H. E. Wilcox Motor Car Co., 1030 Marshall St., Minneapolis, Minn.
- WINTON—gasoline cars, Winton Motor Carriage Co., Berea Road, Cleveland, Ohio.
- WISCO—gasoline pleasure cars, Wisconsin Motor Car Co., Janesville, Wis.
- WOODS—electric automobiles, Woods Motor Vehicle Co., 2515-21 Calumet Ave., Chicago, Ill.

## Z

- ZIMMERMAN—gasoline cars, Zimmerman Mfg. Co., Auburn, Ind.

## Motorcycles

- ALLRIGHT—motorcycles, Prospect Motor Co., 1900 Broadway, N. Y. City.
- AMERICAN—motorcycles, American Motor Cycle Co., Wells and Schiller Sts., Chicago, Ill.
- APACHE—gasoline motorcycles and delivery vans, Brown & Beck, 1437 Tremont St., Denver, Colo.
- ARMAC—motorcycles, Armac Motor Co., 472 Carroll Ave., Chicago, Ill.
- AUTO-BI—motorcycles, The Auto-Bi Co., 1443 Niagara St., Buffalo, N. Y.
- BRADFORD—motorcycles, The Bradford Co., Delaware Ave. & Tinnall St., Wilmington, Del.
- BRADLEY—motorcycles, Bradley Motor Co., 263 Diamond St., Phila., Pa.
- CVS—motorcycles, C. V. Stahl Motor Works, N. E. Cor. 29th and Diamond Sts., Philadelphia, Pa.
- CROUCH—gasoline motorcycles, Crouch Motor Co., Stoneham, Mass.
- CROWN—motorcycles, Great Western Mfg. Co., La Porte, Ind.
- CURTISS—motorcycles, The Herring-Curtiss Co., Hammondsport, N. Y.
- DEPENDABLE HILAMAN—gasoline motorcycles, A. L. Hilaman Co., Moorestown, N. J.
- DUCK—motorcycles, A. W. Duck, 427 15th St., Oakland, Cal.
- EAGLE—motorcycles, Eagle Motor Works, 1111 E. Franklin Ave., Minneapolis, Minn.
- EMBLEM—bicycles and motorcycles, Emblem Mfg. Co., Angola, N. Y.
- EXCELSIOR—motorcycles, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- GEER GREEN EGG—motorcycles, Harry R. Geer Co., 856 McLaran St., St. Louis, Mo.
- GREYHOUND—motorcycles, Greyhound Motor Works, 1443 Niagara St., Buffalo, N. Y.
- HARLEY-DAVIDSON—motorcycle, Harley-Davidson Motor Co., 3800 Chestnut St., Milwaukee, Wis.
- HEATON—gasoline motorcycles, I. N. Bressler & Son, 406-08 E. Third St., Sterling, Ill.
- INDIAN—gasoline motorcycles, Hendee Mfg. Co., 837 State St., Springfield, Mass.
- KIEFLER—motorcycles, Kiefler Motor Works, 184 Broadway, Buffalo, N. Y.
- KOKOMO—gasoline motorcycles, Kokomo Motorcycle Co., Kokomo, Ind.
- LIGHT—chain driven motorcycles, Merkel-Light Motor Co., Pottstown, Pa.
- M. M.—motorcycle, American Motor Co., 705 Center St., Brockton, Mass.
- MAGNET—gasoline motorcycles, Imported by Magnet Motor Co., 1400 Michigan Ave., Chicago, Ill.
- MANSON—gasoline motorcycles, Fowler-Manson-Sherman Cycle Mfg. Co., 900-910 W. Lake St., Chicago, Ill.
- MARVEL—motorcycles, Marvel Motorcycle Co., Hammondsport, N. Y.
- MERKEL—motorcycles, Merkel-Light Motor Co., Pottstown, Pa.
- METEOR—motorcycles, spring frame, Chicago Motorcycle Works, 732 Sheridan Road, Chicago, Ill.
- MIDGET BI-CAR—gasoline motorcycles, Walton Motor Co., Inc., Broadway & Merrick Road, Lynbrook, Long Island, N. Y.
- MINERVA—motorcycles, imported by Geo. V. Lyons Motor Co., 2382-84 Broadway, New York City, N. Y.
- MINNEAPOLIS—gasoline two-speed motorcycle, Minneapolis Motorcycle Co., 517 S. Seventh St., Minneapolis, Minn.
- N. S. U.—motorcycles, N. S. U. Motor Co., 206 W. 76th St., New York City, N. Y.
- NEW ERA AUTO-CYCLE—motorcycles, The New Era Autocycle Co., Dayton, O.
- PEUGEOT—motorcycles, imported by National Sales Corporation, 232 W. 58th St., New York City, N. Y.
- PIERCE—motorcycles & bicycles, The Pierce Cycle Co., 6-22 Hanover St., Buffalo, N. Y.
- \*PUCH—motorcycles, imported by Puch Import Co., Princeton, N. J.
- R-S—gasoline motorcycles, Reading Standard Company, Reading, Penna.
- RAYCYCLE—motorcycles, Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.
- RELIANCE—gasoline motorcycles, Reliance Motor Cycle Co., Owego, N. Y.
- ROYAL PIONEER—motorcycles, Royal Motor Works Co., Worcester, Mass.
- S. D.—motorcycles, S. D. Mfg. Co., 155 Ridgewood Ave., Brooklyn, N. Y.
- SHAW—motorcycles, Shaw Mfg. Co., Galesburg, Kansas.
- SIMPLEX—motorcycles, Prospect Motor Co., 1900 Broadway, N. Y. City.
- THIEM—motorcycles, The Thiem Mfg. Co., Minneapolis, Minn.
- THOR—motorcycles, Aurora Automatic Machinery Co., Aurora, Ill.
- TORPEDO—motorcycles, Hornecker Motor Mfg. Co., Geneseo, Ill.
- TOURIST—two-speed motorcycles, The Keller & Risque Motor Co., 20 W. 3rd St., St. Paul, Minn.
- \*VINDEC SPECIAL—motorcycles, imported by Crownshield & Burlinson, 109 E. 114th St., N. Y. City.
- WAGNER—motorcycles, Wagner Motor Cycle Co., 321-325 Cedar St., St. Paul, Minn.
- YALE—motorcycles and pedal cycles, Consolidated Mfg. Co., Toledo, Ohio.

## Aeronautical

- AERO—aeroplanes, lumber, frame parts, propellers & steering gears, The Aero Supply Co., Cynwyd, Pa.
- AEROLINE—oil, Indian Refining Co., Inc., Cincinnati, O.
- AVISELVA—aluminum alloy, E. Kaiser, 42 Broadway, N. Y. City.
- BEACH—monoplanes, Scientific Aeroplane & Airship Co., Box 773, N. Y. City.
- BURLINGAME—aeroplanes, propellers & gliders, Elmer Burlingame, 928 Oliver Bldg., Boston, Mass.
- CURTISS—aeroplanes & motors, The Herring-Curtiss Co., Hammondsport, N. Y.
- CHAUVIÈRE—propellers, French, International School of Aeronautics, Garden City, L. I., N. Y.
- DURYEA—motors, Chas. E. Duryea, Reading, Pa.
- ERICKA—biplanes, Louis G. Erickson, 29 Woodmont St., Springfield, Mass.
- FEATHERWEIGHT—motors, Elbridge Engine Co., Culver Road, Rochester, N. Y.
- GNOME—motors, French, The Aero-Motion Co., St. Louis, Mo.
- H F—propellers & motors, Harriman Motor Works, South Glastonbury, Conn.
- HAMILTON—gliders, triplane towing machines, monoplanes & biplanes, Thos. F. Hamilton, 208 39th Ave., Seattle, Wash.
- HARROUN—motors, Continental Engine Co., 8-10 S. Canal St., Chicago, Ill.
- HERRING-BURGESS—biplanes, W. Starling Burgess Co., Ltd., Marblehead, Mass.
- HUE—instruments, French, International School of Aeronautics, Garden City, L. I., N. Y.
- KAISER—radiators, E. Kaiser, 42 Broadway, N. Y. City.
- KASMAR—aeroplanes, M. K. Kasmar, 1827 N. Paulina St., Chicago, Ill.
- L. CHAUVIÈRE—propellers, French, The Aero-Motion Co., St. Louis, Mo.
- NALAD—aeronautic fabrics, The C. E. Conover Co., 101 Franklin St., N. Y. City.
- ROBERTSON—aeronautic instruction, The Robertson Aerial Co., Betz Bldg., Phila., Pa.
- STENZY'S—monoplanes & motors, A. F. P. Stenzy, 1019 Binney St., Baltimore, Md.
- SYLVAN—balloons & parachutes, & SYLVAN NEVERFAIL—cutoff for parachutes, Thos. F. Hamilton, 208 30th Ave., Seattle, Wash.
- TERRY—motors, Terry Engine Co., Bay, 43rd & 44th Sts., Ulmer Park, Brooklyn, N. Y.
- WARNER AERO-METER—anemometers, Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis.
- WITTEMANN STANDARD—gliders, aeroplanes, castings, frame parts, turn-buckles & eye bolts, C. & A. Wittemann, 17 & 19 Ocean Terrace, Staten Island, N. Y.
- WRIGHT FLYER—aeroplanes, The Wright Co., 1127 W. 3rd St., Dayton, O.
- WRINKLE'S—varnish for aero cloth, Wrinkle Paint Mfg. Co., Columbus, O.

## General

(This list includes all parts, accessories, machinery, motor boats, etc.—everything not included under "Motor Cars," "Motorcycles" or "Aeronautical.")

- AAA—saw tools & corundum wheels, E. C. Atkins & Co., Indianapolis, Ind.
- \*A. & B.—cements, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
- A and B—gasoline auto & marine motors, friction clutches for autos, American & British Mfg. Co., Bridgeport, Conn.
- ABC—acetylene gas generators for motor boats, Twentieth Century Mfg. Co., 19 Warren St., N. Y. City, N. Y.
- ABC—spark plugs, compression testers & garage tire pumps, Artizan Brass Co., 204 Lincoln Park Blvd., Chicago, Ill.
- A. B. C.—extra tire holders, Motor Car Supply Co., 1451-1455 Michigan Ave., Chicago, Ill.
- A. B. C.—fans, American Blower Co., Detroit, Mich.
- A. B. C.—jacks, A. B. C. Jack Co., 14 Columbus Ave., Boston, Mass.
- A. B. C.—manganese bronze ingots, American Bronze Co., 1415 Niagara St., Buffalo, N. Y.
- A-B-C—oil, Leo Hofmeister Co., 396-98 Clinton St., Milwaukee, Wis.
- A. C.—chucks and collet attachments, The Adjustable Collet Co., 211 High St., Cleveland, Ohio.
- AC—spark plugs, Champion Ignition Co., Flint, Mich.
- A. F. S. CO.—file sharpeners, American File Sharpener Co., 287 Broadway, N. Y. City.
- A. & J.—repair hangers, (cycle & motorcycle), cups for ball bearings & brazing outfits, A. & J. Mfg. Co., 427 W. Randolph St., Chicago, Ill.
- A. J. W. & Co.—gauge lights, planers & breast drills, A. J. Wilkinson & Co., 180-188 Washington St., Boston, Mass.
- A-O-K—metal polishes & wood polishes, Ulrich & Co., 227-233 E. North St., Buffalo, N. Y.
- A-I—metal polish, Chas. H. Rath Co., Inc., 1347 N. Front St., Philadelphia, Pa.
- A. S. B.—leather & steel tire protectors, Queen Mfg. Co., Webster City, Ia.
- A-W—generator for ignition & lighting in motor boats, Atkin-Wheeler, Halesite, Huntingdon Harbor, L. I., N. Y.
- A-Z—ignition batteries, Benjamin Gerdelman Mfg. Co., 4630 Olive St., St. Louis, Mo.
- A-Z—radiators, auto fenders, metal dashes, tanks, hoods, metal hampers, exhaust mufflers, sprocket & step covers, metal mud aprons, fans, gears and pinions, auto bodies and seats, The A-Z Co., 527-9 West 56th St., N. Y. City.
- AARON—fire extinguishers, Robinson Fire Extinguisher Mfg. Co., 4520 N. 20th St., St. Louis, Mo.
- ABBOTT—automatic electric time switches, Abbott Mfg. Co., 9212-14 Central Ave., S. E., Cleveland, Ohio.
- ABRASIVE—grinding wheels, Abrasive Material Co., Phila., Pa.
- ABSORBINE, JR.—liniment, W. F. Young, 77 Temple St., Springfield, Mass.
- \*ACAMEE—metal & wood polish & auto body liquid soap, The Acamee Polish Co., 404 Birr St., Rochester, N. Y.
- ACATENA—side lights, C. Cowles & Co., Water and Chestnut Sts., New Haven, Conn.
- ACCURATE—fire extinguishers, The Tea Tray Co. of Newark, Mulberry & Murray Sts., Newark, N. J.
- ACCURO—voltmeters & ammeters, The Post & Lester Co. 20 Sargeant St., Hartford, Conn.
- ACETYLENE—carbide, Acetylene Co., 38 Park Row, N. Y. City.
- \*ACETVONE—carbide & gas generators, Acetyvone Co., 38 Park Row, N. Y. City.
- ACHESON—graphite & graphited grease, International Acheson Graphite Co., Niagara Falls, N. Y.

- ACKERMAN—wind shields, Jos. N. Smith & Co., Fourth & Porter Sts., Detroit, Mich.
- ACME—bolt & nut machinery, Acme Machinery Co., Cleveland, O.
- ACME—chain hoist, Franklin Moore Co., Winsted, Conn.
- ACME—fire extinguishers, M. L. Snyder, 9 N. 4th St., Phila., Pa.
- ACME—foundry chaplets, parting, facings, etc., Central Foundry Supply Co., West Spring St. & H. V. Ave., Columbus, O.
- ACME—handle bars, Ideal Plating Co., Inc., Marlboro, Mass.
- ACME—metal polish, Acme Polish Co., 810 Second Ave., Pittsburg, Pa.
- ACME—pumps & gasoline storage outfits, Wallman Mfg. Co., 283-285 5th Ave., Milwaukee, Wis.
- ACME—screw machines, slotting machines & pipe nipples, National-Acme Mfg. Co., Cleveland, O.
- ACME—steel mats, Acme Steel Goods Co., 2834 Archer Ave., Chicago, Ill.
- ACME—storage batteries, United Electric Storage Battery Co., 2107 Pine St., St. Louis, Mo.
- ACME—timer & distributor combined, Pittsfield Spark Coil Co., Dalton, Mass.
- ACME—tires, auto, and rubber cloth, Acme Rubber Mfg. Co., E. State St., Trenton, N. J.
- ACME—tire holders, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- ACME—universal joint, Acme Universal Joint & Mfg. Co., 310-11 E. Water St., Kalamazoo, Mich.
- ACORN—carburetors, Generator Valve Co., 294-296 Taaffe Pl., Brooklyn, N. Y.
- ACORN—pump connections, Stevens & Co., 375 Broadway, N. Y. City.
- ACORN—timers, Acorn Brass Mfg. Co., 227 N. Peoria St., Chicago, Ill.
- ACTIVE—grease cups, H. B. Sherman Mfg. Co., 12 Barney St., Battle Creek, Mich.
- ADAMANT—bearing metals, Magnolia Metal Co., 113-115 Bank St., N. Y. City.
- ADAMANTINE—screw plates, American Tap & Die Co., Greenfield, Mass.
- \*A. A. ADAMS—gasoline marine motors, A. A. Adams & Co., 350-354 Fountain St., Providence, R. I.
- ADAMS-FARWELL—automobile motors, The Adams Co., Dubuque, Iowa.
- ADAMS—grease, oil & gear compound, Adams Grease & Oil Co., 159 W. 51st St., N. Y. City.
- ADAMS—grinding stands, snap flasks & foundry supplies, The Adams Co., Dubuque, Iowa.
- ADAPT—wind shields, Adapt Machinery Co., 1620-1630 Wabash Ave., Chicago, Ill.
- ADDISON—steering checks, The Addison, 20-22 S. Hoyne Ave., Chicago, Ill.
- ADD-WEAR—tire sleeves, The Adwear Auto Tire Sleeve Co., N. Attleboro, Mass.
- AD-EL-ITE—wood polishes, paints & varnish remover, Adams & Elting Co., 159-163 Washington Blvd., Chicago, Ill.
- ADJUSTABLE—curtain fasteners, Metal Stamping Co., 30-50 Hubert St., New York City, N. Y.
- ADJUSTO—wind shields, Chicago Wind Shield Co., 235 Johnston St., Chicago, Ill.
- ADLAKE—automobile oil & electric lamps, The Adams & Westlake Co., 319 Ontario St., Chicago, Ill.
- ADLAKE-NEWBOLD—auto lighting dynamos, Adams & Westlake Co., 319 Ontario St., Chicago, Ill.
- ADMIRAL—bicycles, Arnold, Schwinn & Co., 1718-32 N. 43rd St., Chicago, Ill.
- ADVANCE—pyrometers, Wilson-Macaulen Co., N. Y. City.
- ADVANCE—springs, The Jackson Cushion Spring Co., Jackson, Mich.
- ADVANCE—oils, greases, auto body soap & cutting compounds, Alonzo K. Lynch, Inc., 310-12 Flushing Ave., Brooklyn, N. Y.
- ADVANCE—upright drills, Silver Mfg. Co., Salem, Ohio.
- ADVANCE—voltammeters, voltmeters & ammeters, Eldredge Electric Mfg. Co., 3 Post Office Square, Springfield, Mass.
- AEOLUS—tire pumps, hand, Bridgeport Brass Co., Cor. Fairfield & Holland Aves., N. Y. City.
- \*AEOLUS—wind shields, The K & T Mfg. Co., 32 Atlantic Ave., Boston, Mass.
- AEROCHUCK—air chucks and air counter-shafts, Manufacturers Equipment Co., 23-27 N. Jefferson St., Chicago, Ill.
- AETNA—gasoline storage tanks, Fred Kaltenschach, 919 Washington Blvd., Chicago, Ill.
- AFRICAN SLUSH—rust preventers, C. F. Houghton & Co., 240 W. Somerset St., Philadelphia, Pa.
- AGATITE—metal cements, Jas. S. Longhurst, Jr., Lynbrook, L. I., N. Y.
- AIR-CUSHION—shock absorbers, Mellen-Edwards Co., 403 Grand Ave., Beloit, Wis.
- \*AIR-TIGHT—compound to prevent spark plugs from leaking, Pearl Mfg. Co., 135 Dwight St., Springfield, Mass.
- AIR-TIGHT—tanks, Air-Tight Steel Tank Co., 421 Wood St., Pittsburg, Pa.
- AJAX—anti-freezing compounds, metal polish & gasoline storage outfits, Ajax Auto Co., 832-34 E. 43rd St., Chicago, Ill.
- AJAX—automobile bow sockets, top joints, shifting rails & adjustable goosenecks, Cortland Forging Co., Cortland, N. Y.
- AJAX—belting, Thermoid Rubber Co., Trenton, N. J.
- AJAX—brake lining, Calmon Asbestos & Rubber Works of America, 1693 Broadway, N. Y. City.
- AJAX—bumpers, Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill.
- AJAX—hand shears, Acme Shear Co., Bridgeport Conn.
- AJAX—pneumatic hammers, The Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Cleveland, O.
- AJAX—spark plugs, Auto Specialties Mfg. Co., 656-658 3rd St., Milwaukee, Wis.
- AJAX—storage ignition batteries, Ajax Battery Co., 1532 Michigan Ave., Chicago, Ill.
- AJAX—tires, (auto & bicycle), & mats, Ajax-Grieb Rubber Co., 1777 Broadway, N. Y. City.
- AJAX—trunks, Ajax Trunk & Sample Case Co., 91-93 Mercer St., N. Y. City.
- AJAX—wind shields, The Novelty Mfg. Co., Maple St., Waterbury, Conn.
- AKRON—auto & motor boat clutches, Williams Foundry & Machine Co., Akron, O.
- AKRON—enamel & varnish, Akron Varnish Co., Akron, O.
- AKRON-WILLIAMS—vulcanizers, Williams Foundry & Machine Co., Akron, O.
- ALADDIN—portable electric light stand, I. J. Smith Mfg. Co., Inc., 4283 Park Ave., N. Y. City.
- ALAMO—stationary engines, The Alamo Mfg. Co., Hillsdale, Mich.
- ALBANY—grease, oils & grease cups, Adam Cook's Sons, 313 West St., New York City, N. Y.
- ALBANY—japans & shellacs, Eugene E. Nice, 272 S. 2nd St., Phila., Pa.
- ALCO—burners, gas lamp tips & tire tale, American Lava Co., Chattanooga, Tenn.
- ALDERMAN—bicycle wrenches, Frank Mossberg Co., Attleboro, Mass.
- ALDING—leather tire sleeves, Alsten & Goulding, 36 Foster St., Worcester, Mass.
- ALERT—piston ring grinders, S. B. Harding, Waukesha, Wis.
- AL-LECTRO—metal polish, L. B. Allen Co., Inc., 1353 Columbia Ave., Chicago, Ill.
- ALLEN—fire extinguishers, Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.
- \*ALLEN—gasoline cycle & marine motors & auto motors, Allen Motor Co., 11th & Pt. Lobos Ave., San Francisco, Cal.
- ALLEN-RANDALL—bolt clippers, H. K. Porter, 6 Ashland St., Everett, Mass.

- ALLEN'S—gloves, J. C. Allen & Sons, Gloversville, N. Y.
- ALLEN—solder, lamp coloring, soldering sets & commutator lubricant, L. B. Allen Co., Inc., 1353 Columbia Ave., Chicago, Ill.
- ALLEN—tire case, extra tire holders, tire locks, grease bags, universal joint covers & inner tube bags, Allen Auto Specialty Co., 1926 Broadway, New York City.
- ALLIGATOR—leaf springs, Cleveland-Canton Spring Co., Canton, O.
- ALLIGATOR—wrenches, Harris & Reed Mfg. Co., 1500-1578 W. 15th St., Chicago, Ill.
- ALL-IN-ONE—spark plugs, Comet Electric Mfg. Co., Detroit, Mich.
- ALL-RIGHT—spark plugs, Albright Mfg. Co., Columbus, Ga.
- ALLSTEEL—factory equipment, General Fire Proofing Co., Youngstown, O.
- ALL STEEL—screw drivers, Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
- ALLTOGETHER—wrenches, John Stortz & Son, 210 Vine St., Philadelphia, Pa.
- ALLYNE—aluminum, brass and bronze castings, Allyne Brass Foundry Co., Cleveland, O.
- ALMOND—drill chucks, countershafts, flexible tubing, turret heads, tools & tool holders, T. R. Almond Mfg. Co., Ashburnham, Mass.
- \*ALMOND OIL—grease, National Cement & Rubber Mfg Co., 3043-3059 Monroe St., Toledo, O.
- ALMY—timers & water tube boilers, Almy Water Tube Boiler Co., Providence, R. I.
- ALPHA—demountable rims, The Alpha Rim Co., Room 910, Marbridge Bldg., N. Y. City.
- ALPHA—gasoline marine motors, The Aero & Marine Motor Co., 60 Pemberton Square, Boston, Mass.
- ALPHA—gasoline motor boats, marine gasoline motors, propellers & propeller shafts, W. T. Bintliff, Plainfield, N. J.
- ALPHA—rubber tubing, steering wheel grips, gas bags, tire repair patches & rubber horn bulbs, Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y.
- ALPHA—rubber hose & belting, United & Globe Rubber Mfg. Co., Trenton, N. J.
- ALRITE—jacks, National Jack & Mfg. Co., 132 & 34 S. Clinton St., Chicago, Ill.
- ALUMALOYD—aluminum alloy sheets, Stark Rolling Mill Co., Canton, O.
- ALUMA SHEET—aluminum coated steel, Pittsburgh Steel Specialties Co., Pittsburgh, Pa.
- \*ALUMINITE—aluminum solder, Aluminum Solder & Refining Co., Oswego, N. Y.
- ALUNDUM—grinding, rubbing & sharpening stones, Norton Grinding Co., Barbers Crossing, Worcester, Mass.
- ALVERN—ignition & storage batteries, Alvern Battery Co., Evansville, Ind.
- ALWAYS RELIABLE—brazing & soldering torches, Otto Bernz, 21-43 S. 13th St., Newark, N. J.
- AMALIE—oil, grease, metal polish & paint, L. Sonneborn Sons, 262 Pearl St., N. Y. City.
- AMAZON—waterproof motorcycle belting & fan & pump belts, Geo. Rahmann & Co., 6 Ferry St., N. Y. City.
- AMCO—switches, tire holders, robe rails & foot rails, Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill.
- AMERICAN—air compressors, American Steam Pump Co. Battle Creek, Mich.
- AMERICAN—anvils, American Wrought Anvil Co., 12-18 Richardson St., Brooklyn, N. Y.
- AMERICAN—auto tires, American Wood Tire Co., 623 Monadnock Block, Chicago, Ill.
- AMERICAN—ball bearings, American Ball Bearing Co., Edgewater Park & L. S. & M. S. Ry., Cleveland, Ohio.
- AMERICAN—bit braces, Turner & Deegan, Bristol, Conn.
- AMERICAN—boring machines, band saws, saw tables, swing saws, lathes & planers, American Sawmill Machinery Co., Hackettstown N. J.
- AMERICAN—detachable auto tires, American Tire Co., Owosso, Mich.
- AMERICAN—drill grinders, Heald Machine Co., Worcester, Mass.
- AMERICAN—emery wheels, corundum wheels & oil stones, American Emery Wheel Works, Providence, R. I.
- AMERICAN—files & rasps, Nicholson File Co., Providence, R. I.
- AMERICAN—gasoline auto engines, also knock down engines, T. Tallmadge, Baldwinsville, N. Y.
- AMERICAN—gasoline & oil storage outfits, The American Oil Pump & Tank Co., Dayton, O.
- AMERICAN—grinders & grinding attachments, Diamond Machine Co., Providence, R. I.
- AMERICAN—heaters, auto, American Auto Heater Co., Inc., 160 14th St., Buffalo, N. Y.
- AMERICAN—metal polishes, Harvey Chemical Co., Lafayette, Ind.
- AMERICAN—pulleys, American Pulley Co., 29th & Bristol Sts., Philadelphia, Pa.
- AMERICAN—resilient automobile wheels, American Resilient Wheel Co., 1336 New York Ave., Washington, D. C.
- AMERICAN—reverse gears, marine kerosene engines & oil stationary engines, American Oil Engine Co., 1779 Broadway, N. Y. City.
- AMERICAN—rubbing stones, American Stone Co., New Albany, Ind.
- AMERICAN—sparkling coils, timers, switches & spark plugs, American Coil Co., Foxboro, Mass.
- AMERICAN—storage batteries, American Battery Co., 1132-34' Fulton St., Chicago, Ill.
- AMERICAN—taps & dies, wrenches & threading tools, American Tap & Die Co., Greenfield, Mass.
- AMERICAN—vulcanizers, air compressors & gasoline auto engines, Frank W. Bacon, 16th & Harney Sts., Omaha, Nebr.
- AMERICAN CROWN—auto body soap, James S. Kirk & Co., N. Water St., Chicago, Ill.
- AMERICAN CYCLOPEDIA OF THE AUTOMOBILE (publication)—Bacon & Fynney, 120 Boylston St., Boston, Mass.
- AMERICAN IGNITER—timers and spark coils, American Electric Fuse Co., Muskegon, Mich.
- AMERICAN MCINNIS—Hull coating, George N. Gardiner & Son, 15 William St., N. Y. City.
- AMERICAN SWISS—tool makers' files, American Swiss File & Tool Co., 24 John St., N. Y. City.
- AMES—lathes, milling machines & jig filing machines for die work, B. C. Ames Co., 21 Crescent St., Waltham, Mass.
- AMES—sheet packing, gaskets & washers, U. S. Indestructible Gasket Co., 50 Church St., N. Y. City.
- AMES—shovels & polishing & buffing wheels, Frederic B. Stevens, Detroit Mich.
- AMETALHOSE—metal hose and flexible metallic tubing, American Metal Hose Co., 173-177 Lafayette Street, N. Y. City.
- AMHERST—packing, Canfield Mfg. Co., Lehigh Ave. & Howard St., Phila., Pa.
- AMOCO—automobile soap, oils, greases, & graphite, American Oil Co., 170-78 S. Water St., Jackson, Mich.
- AMPVO—storage ignition batteries, Ampvo Battery Co., 1607 Michigan Ave., Chicago, Ill.
- ANCHOR—axles & springs, Sheldon Axle Co., Wilkes-Barre, Pa.
- \*ANCHOR—cements, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, O.
- ANCHOR—metal polish, J. W. Hoffman Co., 8 Medford St., Boston, Mass.
- ANCHOR—nails, Tockwotton Co., 79 S. Main St., Providence, R. I.
- ANCHOR—vises, Prentiss Vise Co., 44 Barclay St., N. Y. City.

- ANCHOR—watch holders, vacuum, Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill.
- ANCHOR BRAND—auto hardware, North & Judd Mfg. Co., New Britain, Conn.
- \*ANDERSON—carburetors, G. W. Miller, 1221 N. 8th St., Quincy, Ill.
- ANDERSON—charging plugs & receptacles, Albert & J. M. Anderson Mfg. Co., 289-293 A St., Boston, Mass.
- ANDERSON—electric grinders & electric breast drills, William S. Nicholls, 253 Broadway, N. Y. City (Mfrs. Agents).
- ANDERSON—gasoline marine & automobile motors, Anderson Engine Co., Shelbyville, Illinois.
- ANDERSON GLASS—spark plugs, Anderson Spark Plug Co., 100 Boylston St., Boston, Mass.
- ANDERSON TURN-MORE—wrenches, The Simplex Mfg. Co., 90 West St., N. Y. City.
- ANDERSON—speed change gears, circulation pumps and mufflers, The Anderson Motor Co., 16th & Jackson Sts., Anderson, Ind.
- ANDRAE—charging panels, switchboards & spark coils, Julius Andrae & Sons Co., 118-20 Sycamore St., Milwaukee, Wis.
- ANDREWS—dry kilns & kiln doors, The A. H. Andrews Co., 174-76 Wabash Ave., Chicago, Ill.
- ANGLE—wind shields, H. J. Russell, 32 Exchange St., Worcester, Mass.
- ANGOLA—stationary engines, Angola Engine & Foundry Co., Angola, Ind.
- ANTI-CARBON—automobile oil, American Oil Co., 170-78 S. Water St., Jackson, Mich.
- ANTI-CARBON—oils, Keystone Supply Co., Columbus, Ohio.
- ANTICARBO—oils, The Cincinnati Oil Works Co., Cincinnati, Ohio.
- ANTI-CORROSIVE—gas engine lubricant, E. H. Kellogg & Co., 243 & 244 South St., New York City.
- ANTI-FRICTION AUTO LUBRICANT—oils, E. H. Kellogg & Co., 243 & 244 South St., New York City, N. Y.
- ANTI-FRICTION—grease, E. H. Kellogg & Co., 243 & 244 South St., New York City, N. Y.
- \*ANTIOAK—leather tires and belting, Anti-oak Leather Co., Los Angeles, Cal.
- ANTI-SELENITE—liquid carbon removers, Anti-Selenite Co., 2230 Olive St., St. Louis, Mo.
- ANTOINETTE—gasoline automobile & marine motors, Antoinette Motor Co., E., Providence, R. I.
- APCO—oil gauges, tire valve tools, timer attachments, lamp lighters, valve grinding tools & crank handle holders, Auto Parts Co., 10 Weybosset St., Providence, R. I.
- APEX—pipe threading & cutting machines, The Merrell Mfg. Co., Toledo, Ohio.
- APLCO—electric lighting & ignition systems, Apple Electric Co., 20 N. Canal St., Dayton, Ohio.
- APOLLO—grease cups, The Lunkenheimer Co., Cincinnati, O.
- APPEAL—bicycles, Appeal Mfg. & Jobbing Co., Los Angeles, Cal.
- APPLE—batteries, dynamos, timers & switches, Dayton Electrical Mfg. Co., 89 St. Clair St., Dayton, O.
- AQUADAG PASTE—graphite and water, Acheson Oildag Co., Niagara Falls, N. Y.
- \*AQUA—rawhide belts, Shultz Belting Co., St. Louis, Mo.
- AQUILA—top dressing & wood polish, Aquila Chemical Co., 187 Third St., Milwaukee, Wis.
- ARCADE—files & rasps, Nicholson File Co., Providence, R. I.
- ARCHIBALD—motor truck wheels, Archibald Wheel Co., Lawrence, Mass.
- ARCO—oil & grease, Atlantic Refining Co., Citizens Bldg., Cleveland, Ohio.
- ARCO—tanks for fuel or water, hoods, mud guards & metal auto bodies, Auto Rebuilding Co., 1307-09 Wabash Ave., Chicago, Ill.
- \*ARCTIC—oil, Vacuum Oil Co., Rochester, N. Y.
- ARDMORE—gasoline marine motors, Henry Keidel Co., 405 West German St., Baltimore, Md.
- AREAMETER—leather measuring machines, Tufting Machine Supply Co., 1200 Michigan Ave., Chicago, Ill.
- AREMCO—tire holders, robe rails, trunk racks & bumpers, Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.
- ARGOLINE—auto oils, Ellis & Cummings Oil Works, Foot of Chestnut St., Reading, Pa.
- ARGUS—dash mirror, Motor Car Equipment Co., 55 Warren St., N. Y. City.
- ARKANSAS—oilstones, Pike Mfg. Co., Pike, N. H.
- ARMAC—motorcycle side car & delivery attachments, cycle motors & motorcycle frame fittings, Armac Motor Co., 472 Carroll Ave., Chicago, Ill.
- ARMALAC—insulating shellac, Massachusetts Chemical Co., Walpole, Mass.
- \*ARMSTRONG IMPROVED PALMER—bicycle tires, A. G. Armstrong, 410 W. 13th St., N. Y. City, N. Y.
- \*ARNSTEIN—automobile & bicycle cements, vulcanizing solutions, enamels & decarbonizers, Eugene Arnstein, 35th & Shields Ave., Chicago, Ill.
- ARPECO—wrenches & vises, Rogers, Printz & Co., Warren, Pa.
- ARROW—aluminum solder, The Lester Co., Fayetteville, N. Y.
- ARROW—axles, Cleveland Axle Mfg. Co., Canton, Ohio.
- ARROW BRAND—asphalt roofing, Asphalt Ready Roofing Co., 136 Water St., N. Y. City.
- \*ARROW—gasoline marine motors, Buffalo Auto-Truck & Motor Co., 123 Erie Co., Bank Bldg., Buffalo, N. Y.
- ARROW—tool steel, imported by John A. Crowley & Co., 120 Liberty St., N. Y. City.
- ARROW—waste cans, Arrow Can Co., 35 Warren St., N. Y. City.
- ARSENAL—paints & colors & ARSENAL LIQUID GUN METAL—lacquers, Arsenal Varnish Co., 25th St. & 4th Ave., Rock Island, Ill.
- ARSENO—lamp adapters, electric, Arseno Electric Co., 819A Boylston St., Boston, Mass.
- ARTIZAN—air compressors, Artizan Brass Co., 204 Lincoln Park Blvd., Chicago, Ill.
- ASCO—horn bulb protectors, American Spring & Supply Co., 135 Johnson St., Brooklyn, N. Y.
- ASHCROFT—valve grinders, breast drills & steam & air gauges, Ashcroft Mfg. Co., 85-89 Liberty St., N. Y. City.
- ASHTABULA—leather trimming & leather top materials, Ashtabula Hide & Leather Co., Ashtabula, O.
- ASHTON—acetylene separators, W. E. Ashton & Door Co., 2011 Walnut St., Phila., Pa.
- ASHTON—valves, cocks, whistles, gauges, etc., Ashton Valve Co., 271 Franklin St., Boston, Mass.
- ASTRAL—storage batteries, Astral Storage Battery Co., 718 Jackson Blvd., Chicago, Ill.
- ASTROM—air compressors, Ft. Wayne Engineering & Mfg. Co., Ft. Wayne, Ind.
- ATHERTON—coaster brakes, Buffalo Metal Goods Co., 865 Lafayette Ave., Buffalo, N. Y.
- ATKINS—auto tops, Atkins & Townsend, Felton, Del.
- ATKINS KWICK KUT—hack saws, E. C. Atkins & Co., Indianapolis, Ind.
- ATLANTIC—gasoline marine motors, The Atlantic Co., Amesbury, Mass.
- ATLANTIC SPECIAL—gasoline marine motors, The Atlantic Co., Amesbury, Mass.
- \*ATLANTIC—varnishes, Atlantic Drier & Varnish Co., Phila., Pa.
- ATLAS—automobile jacks, & tire repair tools, U. S. Jack Co., 644 W. Lake St., Chicago, Ill.



- ATLAS—bumpers, S. Toffler Co., Inc., 145th St. & Southern Blvd., N. Y. City.
- ATLAS—chain blocks, Schuchardt & Schutte, 90 West St., N. Y. City.
- ATLAS—grease and oil, Swan & Finch Co., 151 Maiden Lane, N. Y. City.
- ATLAS—inner tubes, cases & vulcanizers, Atlas Rubber Co., Niagara & Massachusetts Ave., Buffalo, N. Y.
- ATLAS—nuts, bolts, rivets & screw machine products, Atlas Bolt & Screw Co., 1289 Marquette Road, N. E., Cleveland, Ohio.
- ATLAS—pump governors & reducing valves, Hall Mfg. Co., John & Gold Sts., N. Y. City.
- ATLAS—tempering steels, Atlas Steel Co., Dunkirk, N. Y.
- ATLAS—top irons, Cortland Forging Co., Cortland, N. Y.
- ATMOGEN—stationary gas & gasoline engines, Atmogen Machine Works, Westminster Station, Vt.
- ATWATER-KENT—switches, Atwater-Kent Mfg. Works, 42-46 N. 6th St., Philadelphia, Pa.
- ATWOOD—dome lights, electric lamps, acetylene lamps, acetylene gas generators & lamp brackets, The Castle Lamp Co., Toledo, O.
- AUBURN—auto ball bearings, Auburn Ball Bearing Co., 29-35 Elizabeth St., Rochester, N. Y.
- AUBURN—spark plugs, The New York Mica & Mfg. Co., 122 Clark St., Auburn, N. Y.
- AUDEMAIR—goggles, Spencer Optical Mfg. Co., 31 Maiden Lane, N. Y. City.
- AURISTOPHONE—telephones, H. G. Pape Electric & Mfg. Co., 551 Genesee St., Buffalo, N. Y.
- AURORA—clocks, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- AURORA—drill presses, The Aurora Tool Works, Aurora, Ill.
- AURORA—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- AURORA—oil auto lamps, New York Auto Lamp Co., 68 Clarkson St., N. Y. City.
- AURORA—oils, grease & auto body soap, The Pigot, Sayre Co., 135 William St., N. Y. City.
- AUSTRIAN—cutting oil, White Refining Co., 77 Main St., Buffalo, N. Y.
- AUTEX—ignition & vehicle batteries, Willard Storage Battery Co., Marquette Road & Lakeside, Cleveland, O.
- AUTHENTIC—seachlight, Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City.
- AUTO—fuel & oil cans (safety), C. Rudman, 277 Pearl St., N. Y. City.
- AUTO—grease cups, Tell City Foundry & Machine Works, Tell City, Ind.
- AUTOART—speed change gears, crank cases & rear axles, Auto Parts Mfg. Co., 1359-79 St. Antoine St., Detroit, Mich.
- AUTO-AUTOMATIC—wind shields, Auto-Automatic Wind Shield Co., Inc., Detroit, Mich.
- AUTOBESTINE—brake lining, Woven Steel Hose & Rubber Co., Trenton, N. J.
- AUTOBESTOS—packing, Keasby & Mattison Co., Ambler, Pa.
- AUTO-BI—motorcycle parts, The Greyhound Motor Works, 1443 Niagara St., Buffalo, N. Y.
- AUTOBIS—electric auto horns, Holtzer-Cabot Electric Co., Boston, Mass.
- AUTO-BRIGHT—metal polishes, Adams & Elting Co., 159-163 Washington Blvd., Chicago, Ill.
- AUTOBY—oils, Great Western Oil Co., 2855 E. 37th St., Cleveland, O.
- AUTO CAMP—camping outfits, Charles J. Godfrey Co., 10 Warren St., N. Y. City, N. Y.
- AUTO CARBON REMOVER—carbon removers, Whitney Chemical Co., 6122 Euclid Ave., Cleveland, O.
- AUTOCELL—ignition batteries, National Carbon Co., Lock Drawer "L," Cleveland, O.
- AUTOCHIMES—automobile horn, Gray-Hawley Mfg. Co., 605-609 Fort St., West Detroit, Mich.
- AUTOCLEAN—auto body, cleansing compound, Bridgeport Wood & Finishing Co., New Milford, Conn.
- AUTOCL—wrenches, Motor Parts Co., Plainfield, N. J.
- AUTOCOIL—spark coils, The Autocoll Co., 132-136 Seventh St., Jersey City, N. J.
- AUTO-CONTACT—battery cases, A. Hall Berry, 97-99-101 Warren St., New York City, N. Y.
- AUTOCRAT—goggles, hydrometers, hydrometer syringes, thermometers, mirrors & oil guns, imported by American Thermoware Co., 16 Warren St., New York City, N. Y.
- AUTOCRAT—ignition batteries, Stackpole Battery Co., St. Marys, Pa.
- AUTO-CREEPER—trucks, The Brown Co., 1071-73 S. Clinton St., Syracuse, N. Y.
- AUTO-CUSHION—shock absorbers, Mellen-Edwards Co., 403 Grand Ave., Beloit, Wis.
- AUTO DRAFT—cable & drum for pulling out of mud holes, Auto Draft Co., Lake City, Minn.
- AUTODRIVER—screw drivers, Bridgeport Hardware Mfg. Corp., Bridgeport Conn.
- AUTO ELECKTRIC—vulcanizers, J. L. Gibney & Bro., 215-17 N. Broad St., Phila., Pa.
- AUTO-FELT—boots, A. H. Putnam & Co., Danvers, Mass.
- AUTO GEAR COMPOUND—grease, Cleveland Auto-Clutch Dressing Co., Cleveland, O.
- AUTO-GRAPH—graphite, Woods & Peck Co., Wurtsboro, N. Y.
- AUTO-GREAS—grease, New York & New Jersey Lubricant Co., 165 Broadway, New York City.
- AUTOKIT—tool kits, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- AUTO-KLEAN—wood polishes, John Lucas & Co., Phila., Pa.
- \*AUTO-LAMP—lamp numbers, The Bongartz Co., 1777 Broadway, N. Y. City.
- AUTO-LEATHER—mackintosh fabrics, rubber cloths, linings, water-proof imitation leather, William R. Laldlaw, Jr., 218 W. 47th St., New York City.
- AUTO-LIGHT—lamp lighters, Rolfe-Fox Co., 407A Livingston Bldg., Rochester, N. Y.
- AUTOLINE—oils, Wm. C. Robinson & Son Co., 336-342 North St., Baltimore, Md.
- \*AUTO LOCK—lever locks, The Bongartz Co., 1777 Broadway, N. Y. City.
- AUTO-LOCK—safety auto locks, Auto Safety Specialty Co., Buffalo, N. Y.
- AUTOLYTE—acetylene gas lamps, Autolyte Mfg. Co., 26 Warren St., N. Y. City.
- AUTO-MARINE—spark plugs, Legnard Bros., 203-05 Genesee St., Waukegan, Ill.
- AUTO-MAT—robes, Burlington Blanket Co., Burlington, Wis.
- AUTOMATIC—marine motors & stationary engines, Automatic Machine Co., Bridgeport, Conn.
- AUTOMATIC TRIP—automobile jacks, Wm. E. Pratt Mfg. Co., 91 Lake St., Chicago, Ill.
- AUTO-NOT-FREEZE—anti freezing compounds, Grasselli Chemical Co., Cleveland Ohio.
- AUTO-PHONENDOSCOPE—trouble finder in engine, G. P. Pilling & Son Co., Phila., Pa.
- AUTOPOWER—carbon removers, Lakewood Chemical Co., 805 Citizens Bldg., Cleveland, Ohio.
- AUTO PNEUMATIC—wind shields, The Automobile Equipment Co., 260 Jefferson Ave., Detroit, Mich.
- \*AUTO SET—wrenches, The J. R. Long Wrench Co., Akron, Ohio.
- AUTO-SHINE—metal polishes, J. C. Paul & Co., 59 Dearborn St., Chicago, Ill.
- AUTO-SHINE—wood polish, C. J. Nesmith Co., Reading, Mass.
- \*AUTO-SIREN—exhaust auto horns, The Bongartz Co., 1777 Broadway, N. Y. City.



AUTO SPRING REPAIRER—spring repair devices, Auto Spring Repairer Co., 123 Liberty St., N. Y. City.  
 AUTO SPRING REPAIR CO.—Tool kits, Auto Spring Repairer Co., 123 Liberty St., N. Y. City.  
 AUTO T. & R. Co.—auto friction clutches, repair parts for White steam cars, Auto Trading & Repair Co., 1515 Prospect Ave., Cleveland, Ohio.  
 AUTO-TIRE—vulcanizers, cores, moulds, etc., Auto-Tire Vulcanizer Co., Lawrence St., Lowell, Mass.  
 AUTO WIND SHIELD—wind shields, Auto Wind Shield Co., Cambridge, Mass.  
 AVALON—automobile lamps, horns, wind shields, cements, timers & coils, The Ball-Flintze Co., Newark, Ohio.  
 AVERY—sensitive drills, The Cincinnati Machinery Co., Cincinnati, Ohio.  
 AVIL—steel tire case, anti-skids and wind shields, Automobile Metal Specialty Co., 4130 Market St., Phila., Pa.  
 AYES—woodworkers' vises, Ayes & Co., 1812-16 Ellen St., Chicago, Ill.  
 AYROLITE—metal polish, Acme Polish Co., 810 Second Ave., Pittsburgh, Pa.  
 AZTEC—oil storage outfits, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.

## B

B. B. ASPHALTUM—roofing paints, Asphalt Ready Roofing Co., 136 Water St., N. Y. City.  
 B. B.—pumps, garage tire, Herz & Co., 203-205 Lafayette St., N. Y. City.  
 B. & C.—wrenches, Bemis & Call Hardware & Tool Co., 983 Main St., Springfield, Mass.  
 B. C. I.—bicycle pedals, The Standard Co., Torrington, Conn.  
 \*B. G. v. R.—automobile & marine motors & carburetors, Mercedes Motor Mfg. Co., New Kensington, Pa.  
 B. & H.—exhaust horns, T. J. Peterson Co., Security Bldg., Chicago, Ill.  
 B. & H.—metal polish, Bacon & Hancock, 715 Congress Ave., Austin, Tex.  
 B. & J.—lock switch, B. & J. Mfg. Co., 3975 Cottage Grove Ave., Chicago, Ill.  
 B. K. F.—ball bearings, imported by J. H. Lehman Mfg. Co., 500 Fifth Ave., N. Y. City.  
 B. & K.—cutting-off machines & pipe cutting & threading machines, Bignall & Keeler Mfg. Co., Edwardsville, Ill.  
 B & L—trailing spindle, Queen Mfg. Co., Webster City, Iowa.  
 B. O. E.—spark plugs, The Delta Mfg. Co., Bloomfield, N. J.  
 \*B & Q—gasoline marine motors, Bowen & Quick, Auburn, N. Y.  
 B. & R.—wrenches, bearing & carbon scrapers, robe rails, foot rails & inspection lamps, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.  
 B. & B. RING PISTON—grease & oil guns, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.  
 B & O LINE—clocks, robe rails, foot rests & anti-skid devices, Baldwin & Overholt, Galesburg, Ill.  
 B. & S.—auto wrenches, steering connections & forgings, Billings & Spencer Co., 211 Lawrence St., Hartford, Conn.  
 B. & S.—igniters, Briggs & Stratton Co., Milwaukee, Wis.  
 B. T. K.—automobile & buggy parts, change speed levers, clutches, brake levers, speed change gears, steering apparatus, universal joints & brake lining, Auto Parts Mfg. Co., South Elliot St. & T. E. W. R., Muncie, Ind.  
 B-BRITE—metal polish, Missouri Chemical Co., Holden, Mo.  
 B-LINE—oil & grease guns, Randall-Faichney Co., 251 Causeway St., Boston, Mass.

BABY—brazing & soldering torches, Crescent Co. Valparaiso, Ind.  
 BABY—nipple grips, cycle, Keyser Fry, 723-25 Chestnut St., Reading, Pa.  
 BABY—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.  
 BABY NATIONAL—jacks, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.  
 BACHER—glass front cleaners, B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, O.  
 BACKE—timers, carburetors, spark plugs & mechanical tire inflators, Backe Commutator Co., 33 Herkimer Place, Brooklyn, N. Y.  
 BADGER—stationary engines, The Christenson Engineering Co., 845-847 30th St., Hillside, Ill.  
 BADGER STEERSMAN—Auto Steering Co., Baraboo, Wis.  
 BADGER—tops & wind shields, Wisconsin Auto Top Co., Racine, Wis.  
 BAFFLER—belting & gaskets, Thermoid Rubber Co., Trenton, N. J.  
 BAILEY—auger bits, Ohio Tool Co., Columbus, Ohio.  
 BAILEY—detachable auto tires, C. J. Bailey & Co., 22 Boylston St., Boston, Mass.  
 BAILEY—oil, grease, gear cutting compounds & waste, Bailey Oil Co., Toledo, O.  
 \*BAILEY-CONQUEROR—auto pneumatic wheels, The Detroit Pneumatic Wheel Co., Detroit, Mich.  
 BAILEY'S CROWN—metal & wood polishes, The Crown Mfg. Co., 407 S. Illinois St., Indianapolis, Ind.  
 BAIR—bow separators & curtain fasteners, Auto Specialties Mfg. Co., Inc., 811-816 Unity Bldg., Chicago, Ill.  
 BAIRD—tumbling barrels and wire and sheet metal machines, The Baird Machine Co., Oakville, Conn.  
 BAIRD—tumbling barrels, Bennett & O'Connell Co., 97-101 S. Clinton St., Chicago, Ill.  
 BAKER—garage heaters, The Wm. C. Baker Heating & Supply Co., 43 Liberty St., N. Y. City.  
 BAKER—sparkling points for marine & auto engines, platinum & Iridio platinum wire, Baker & Co., Newark, N. J.  
 BAKER—spark plugs, The Hampton Roads Cutlery Co., Box 552 Norfolk, Va.  
 \*BALDRIDGE—reversing gears for motor boats, Gies Bros., 514 Wayne Co. Bank Bldg., Detroit, Mich.  
 BALDWIN—cycle & driving chains, Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass.  
 BALDWIN—route guides & tumbler carriers, The Baldwin Mfg. Co., 143 Federal St., Boston, Mass.  
 BALL—transmission gears for autos, New York Gear Works, 56 Greenpoint Ave., Brooklyn, N. Y.  
 BALL MULTI-SPARK PLUG—spark plugs, The Ball Multi-Spark Plug Co., 202-08 1st St., S., Aberdeen, S. D.  
 BALL SPRAY—carburetors, Chas. D. Shain, 70 Murray St., N. Y. City.  
 BALTIMORE, gasoline marine motors, Page Engineering Co., 113-121 E. York St., Baltimore, Md.  
 BALZER'S—interchangeable license hangers and lamp numbers, Gus Balzer, 1777-79 Broadway, N. Y. City.  
 BANKER—Wind shields, Banker Bros. Co., Baum & Beatty Sts., Pittsburgh, Pa.  
 BANNER—combination vise, Newhall Chain Forge and Iron Co., 90 West St., N. Y. City.  
 BANNER—oils & greases, Clarkson & Ford Co., 55 Water St., N. Y. City.  
 BANNER—oils & greases, boiler & brazing compounds & belt dressing, Cortland Specialty Co., 176 Railroad St., Cortland, N. Y.  
 BANNER—window locks & anti-rattlers, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.  
 BANTAM—ball bearings, Bantam Anti-Friction Co., Bantam, Conn.  
 \*BARBER—automobile engine starters, Motor Safety Mfg. Co., 247 Water St., Brooklyn, N. Y.

- BARBERS**—bit braces, Turner & Deegan, Bristol, Conn.
- BARCO**—four-tone auto & motor boat chimes, motorcycle whistles, flexible joints, muffler cutouts, priming cups & tank carriers, for Prest-O-Lite tanks, Barco Brass & Joint Co., N. Jefferson St., Chicago, Ill.
- BARD**—pipe & flange unions, Bard Union Co., Norwich, Conn.
- BARNARD**—tire pressure registers, safety match box, springs, camping outfits & limousine fittings, Barnard Specialty Co., 800 H. W. Hellman Bldg., Los Angeles, Cal.
- BARNDT-JOHNSTON**—bodies, tops, wind shields and auxiliary seats, Barndt-Johnston Auto Supply Co., 426 Donaldson St., Columbus, Ohio.
- BARNES**—brass tubular steering wheels for boats & wrenches, The Barnes Tool Co., New Haven, Conn.
- BARNES**—foot & steam power lathes, upright, horizontal, gang & multiple drills & arbor drill presses, W. F. & John Barnes Co., 204 Ruby St., Rockford, Ill.
- BARNES**—pipe cutters, Collmer Bros., 105 Vistula Ave., South Bend, Ind.
- BARNES**—steering apparatus, Barnes Gear Co., Oswego, N. Y.
- BAR NIC**—battery connections, Barcy & Nicholson, 967 Howard St., Detroit, Mich.
- BARRETT**—automobile jack, Duff Mfg. Co., Westinghouse Bldg., Pittsburg, Pa.
- BARRETT**—boring machines, metal, Barrett Machine Tool Co., Meadville, Pa.
- BARRETT**—inner tire sleeves, Lynn Auto Co., 29 Sea St., Lynn, Mass.
- BARRET JUNIOR**—automobile jacks, Duff Mfg. Co., Westinghouse Bldg., Pittsburg, Pa.
- BARTH**—automobile jacks, Barth Mfg. Co., 348 Milwaukee St., Milwaukee, Wis.
- BASCO**—fuel & oil cans, Arrow Can Co., 35 Warren St., N. Y. City.
- BASSFORD**—carburetors, Motor Appliance Co. of America, 73 Warren St., N. Y. City.
- BASSON**—automobile horns, imported by Chas. E. Miller, 97-101 Reade St., N. Y. City.
- \*BATCHELDER**—boat propellers & reversing gears for boats, Batchelder Machinery Co., Jamestown, N. Y.
- BATES GRIT SOAP & BATES RITE OFF**—hand soap, Howard M. Bates, 1018-34 Fairmount Ave., Phila., Pa.
- \*BAUMETZ**—current indicator & circuit breaker combination, The Empire Auto Specialty Mfg. Co., Berea, O.
- BAUM'S**—hand & auto body soap, grease, oils, metal polish, top dressing & anti-freezing solutions, Baum's Castorine Co., Rome, N. Y.
- BAUM'S CYLOILENE & BAUM'S NEAT-FOOT**—oils, Baum's Castorine Co., Rome, N. Y.
- BAUCH & LOMB**—mangin lens mirrors, Bauch & Lomb Optical Co., Rochester, N. Y.
- BAY STATE**—emery wheels, Bay State Emery Wheel Co., Worcester, Mass.
- BAY STATE**—hack saws, Simonds File Co., Fitchburg, Mass.
- BAY STATE**—taps & dies, screw plates, wrenches, countersinks & chasers, Bay State Tap & Die Co., Mansfield, Mass.
- BAY STATE AUTOKIT**—wrenches, Geo. A. Cutter, Taunton, Mass.
- BAY STATE LIGHTNING**—wood working clamps, Geo. A. Cutter, Taunton, Mass.
- BAY STATE STICKIT**—wrenches, Geo. A. Cutter, Taunton, Mass.
- \*BEACH**—auto vest, Wm. W. Brown, Worcester, Mass.
- \*BEAN'S**—oil storage outfits and emergency spring lifts & gasoline & oil pumps, The Empire Auto Specialty Mfg. Co., Berea, Ohio.
- BEAT-M-ALL**—spark plugs, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- BEATSEMAL**—tire repair kits, auto & motorcycle, Rock Island Specialty Mfg. Co., Rock Island, Ill.
- BEATS THE GRINDSTONE**—tool grinders, Royal Mfg. Co., Lancaster, Pa.
- BEAVER**—belting, Apex Belting Co., 242 Chestnut St., Phila., Pa.
- BEAVER**—die stocks, stocks and dies, The Borden Co., Warren, Ohio.
- BEAVER**—leather for upholstery, M. Straus & Sons, Frelinghuysen Ave., Newark, N. J.
- BEAVER**—motors (gasoline auto & marine), Beaver Mfg. Co., 783 Chase St., Milwaukee, Wis.
- BECKER**—cushion fillings, Chas. W. Becker, Amsterdam, N. Y.
- \*BECK-IDEN**—auto lamps, Acetylene Lamp Co., 50 University Place, N. Y. City.
- BECO**—enamels, Buffalo Enamel & Stain Co., Lord, Clinton & James Sts., Buffalo, N. Y.
- BEECHER**—wind shields & bow socket, Limousine Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill.
- BEERS**—gasoline motor boats, marine motors, & thermostats, Beers Bros. Engine Co., Portland Ave., cor. Norton St., Rochester, N. Y.
- BELFUSS**—gasoline auto & marine engines & stationary engines, Belfuss Motor Co., cor. Saginaw & M. C. R. R. Co., Lansing, Mich.
- \*BELL**—carburetors, Bell Carburetor Co., Aurora, Ill.
- BELLAMY**—mirrors, dashboard, The Novelty Mfg. Co., Maple St., Waterbury, Conn.
- BEMUS**—timer, The Waterhouse Co., 6 Pelham St., Boston, Mass.
- BEN-FRANKLIN**—magnetos, National Steel Products Co., Lorain, O.
- BENNETT**—carburetors, Wilcox - Bennett Carburetor Co., 1030 Marshall St., N. E., Minneapolis, Minn.
- BENNETT**—oil hole covers, emery wheel dressers & truing tools, Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
- BENNETT**—pedals, J. W. Grady & Co., 68 High St., Worcester, Mass. (Mfr's. agents).
- BENTON**—gasoline marine motors, reverse gears & propellers, Thos. P. Benton & Son, La Crosse, Wis.
- BERINGER**—anti-freezing compound, George M. Beringer, Camden, N. J.
- BERNARD**—pliers, Wm. Schollhorn Co., New Haven, Conn.
- BERRY'S SUB-MARINE**—boat paints, Sub-Marine Paint Co., 133 Coyle St., Portland, Me.
- BERRY**—speed change lever, Chas. W. Berry, Gray, Me.
- BERTRAMS**—metal polish, New Jersey Paint Works, Wayne & Fremont Sts., Jersey City, N. J.
- BESLY**—disc grinders, Chas. H. Besly & Co., 15-21 S. Clinton St., Chicago, Ill.
- BESSEMER**—air compressors, stationary engines and friction clutches, The Bessemer Gas Engine Co., Grove City, Pa.
- BESTALLIC**—Brake lining, Advance Packing & Supply Co., 55 S. Canal St., Chicago, Ill.
- BEST**—file handles, Troy File Works, Troy, N. Y.
- BEST**—file handles, American File Sharpener Co., 287 Broadway, N. Y. City.
- BEST**—steel cement for filling holes in defective castings, Central Foundry Supply Co., West Spring St. & H. V. Ave., Columbus, O.
- BEST**—torches, The Best Light Co., Canton, Ohio.
- BEST**—spark plugs, Best Ignition Equipment Co., 1900 Broadway, N. Y. City.
- BEST OF ALL**—metal polish, Essex Paint Works, Essex, Conn.
- BESTOVALL**—oil, grease & wrenches, Pittsburg Gage & Supply Co., 30th & Liberty Sts., Pittsburg, Pa.
- BETHLEHEM**—steel, forgings, etc., Bethlehem Steel Co., South Bethlehem, Pa.

- BETTERMAN**—axle stools, steel trestles, body trucks, armature stands, vise supporters & drip pans, Johnstown Automobile Co., Inc., 101 Main St., Johnstown, Pa.
- BEVIN**—bicycle & motorcycle bells, toe clips, trouser guards, bilge pumps, Bevin Bros. Mfg. Co., East Hampton, Conn.
- BEYER**—watchmen's portable clocks, Hardinge Bros., 3133-41 Lincoln Ave., Chicago, Ill.
- BI-CAL-KY**—shock absorbers, Bi-Cal-Ky Auxiliary Spring Co., 866 Prospect Ave., Buffalo, N. Y.
- BIGELOW-HORNSBY**—water & fire tube boilers, Bigelow Co., New Haven, Conn.
- BIG 4**—oils, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- BIJUR**—storage ignition batteries & battery supplies & positive plates for vehicle batteries, Westinghouse Storage Battery Co., Boonton, N. J.
- BILL BAILEY**—metal polish, Bailey Oil Co., Toledo, O.
- BILLIKEN**—radiator ornaments, Billiken Co., 290 Fifth Ave., Chicago, Ill.
- BILLINGS**—wrench (bicycle), Billings & Spencer Co., 216 Lawrence St., Hartford, Conn.
- BILLY HELL**—voltmeters, Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis.
- BINKS**—tire garage pumps, The Star Brass Works, 123 N. Jefferson St., Chicago, Ill.
- BIRCHWOOD**—ball & socket joints, C. W. Birchwood, 3614 W. Harrison Ave., Chicago, Ill.
- BISCHIOFF'S**—German chrome nickel steel, Sier-Bath Co., 143 W. 54th St., N. Y. City, N. Y.
- BISHOP**—ignition cable & rubber insulated wire, Bishop Gutta-Percha Co., 420 E. 25th St., N. Y. City.
- BISON**—ignition batteries, storage & vehicle batteries, Bison Storage Battery Co., Buffalo, N. Y.
- BISON, JR.**—ignition batteries, storage, Bison Storage Battery Co., Buffalo, N. Y.
- B JOURNAL COMPOUND**—grease, Wm. C. Robinson & Son Co., 336-342 North St., Baltimore, Md.
- BLACK BARE**—gaskets, engine packings, Thermoid Rubber Co., Trenton, N. J.
- BLACK DIAMOND**—case-hardening bone, The Rogers & Hubbard Co., Middletown, Conn.
- BLACK DIAMOND**—files & rasps, G. & H. Barnett Co., Phila., Pa.
- BLACK DIAMOND**—friction tapes, The M. W. Duntun Co., Providence, R. I.
- BLACK DIAMOND**—saw filing machines & band saws, Black Diamond Saw & Machine Works, Natick, Mass.
- BLACK ELASTIC**—paints, The Connecticut Oil Co., Waterbury, Conn.
- \*BLACK GHOST**—gloves, James Heagle, First Ave. & Market St., Johnstown, N. Y.
- \*BLACK HAWLK**—metal polish, auto body soaps, top dressing, grease & oil, Taylor Mfg. Co., 468 Main St., Charlestown, Boston, Mass.
- BLACK JACK**—ignition storage batteries, inspection lamps, electric auto lamps & lamp connectors, Benoist Bros. Mfg. Co., 3923 Olive St., St. Louis, Mo.
- BLACKMER**—circulation pumps, Blackmer Rotary Pump, Power & Mfg. Co., Petoskey, Mich.
- BLACK VELVET**—cushion springs, National Spring & Wire Co., Albion, Mich.
- BLACKSTONE**—screw drivers, Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
- BLAICH MODERN CARBONIZER**—case hardening compounds, Alfred O. Blaich, 934-33 Pratt St., Chicago, Ill.
- BLAIR**—shovels & polishing & buffing wheels, Frederic B. Stevens, Detroit, Mich.
- BLAKE**—soldering flux, Blake Signal & Mfg. Co., 246 Summer St., Boston, Mass.
- \*BLANCHARD**—tire tools, auto, A. W. Blanchard, 342 Flatbush Ave., Brooklyn, N. Y.
- BLEVNEY**—friction clutches, John C. Blevney, 216-224 High St., Newark, N. J.
- BLIZZARD**—anti-freezing compounds, Globe Soap Co., Cincinnati, O.
- BLIZZARD**—tire pumps, Bridgeport Brass Co., Cor. Fairfield & Holland Aves., N. Y. City.
- BLOOD**—universal joints & steering devices, Blood Bros. Machine Co., 633 W. Ransom St., Kalamazoo, Mich.
- BLUE BLAZE**—spark plugs, National Steel Products Co., Loraine, O.
- BLUE LABEL**—drill rod, Kidd Bros. & Burgher Steel Wire Co., Alliquippa, Pa.
- BLUE RIBBON**—cream & auto body cleaning compound, International Metal Polish Co., 2142 N. Capitol Ave., Indianapolis, Ind.
- BLUE RIBBON**—horns, electric, auto, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- BLUE RIBBON KLEANOLIO**—fabric cleanser, International Metal Polish Co., 2142 N. Capitol Ave., Indianapolis, Ind.
- \*BOARDMAN**—wrenches, Tower & Lyon Co., 95 Chambers St., N. Y. City.
- \*BOHLER'S STYRIAN**—steels, imported by Houghton & Richards, 150 Oliver St., Boston, Mass.
- BOILERINE**—radiator purifying compounds, Straus Boilerine Co., 55 Broad St., N. Y. City.
- BOILERLESS**—steam vulcanizers, Wishart-Burge Mach. Works, 55-66 N. Jefferson St., Chicago, Ill.
- BON MARCHE**—inner tubes, Automobile Tire Co., Inc., 1625 Broadway, N. Y. City.
- BONNEY**—vises, wrenches, comb, wrenches & pipe cutters' comb, pliers & lathe dogs, Bonney Vise & Tool Works, Allentown, Pa.
- BOOSTER**—jacks, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- BOOTH**—demountable rims, Booth Demountable Rim Co., 8410 Lake Ave., Cleveland, Ohio.
- BORATED TALCUM**—hand soap, American Talc Co., 22-24 Custom House St., Boston, Mass.
- BORAX-ETTE**—welding compound, Cortland Welding Compound Co., Cortland, N. Y.
- BORDER**—bolt & nut lock, Border Bolt & Nut Lock Co., Richmond, Ind.
- BOSCH**—magneto, spark plug & terminal, Bosch Magneto Co., 223-225 W. 46th St., New York City, N. Y.
- \*BOSS**—fuel strainers, William S. Jones, 3038 Chestnut St., Phila., Pa.
- BOSS**—hand auto tire pumps, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- BOSS**—power hammers, Novelty Iron Works Dubuque, Iowa.
- BOSS**—pump connections, Stevens & Co., 375 Broadway, N. Y. City.
- BOSTON**—gasoline marine motors, Marine Motor Mfg. Co., 5 Park Sq., Boston, Mass.
- BOSTON**—goggles, Texas Co., 212-14 Kinzie St., W., Chicago, Ill.
- BOSTON**—rubber hose, Boston Belting Co., 256-60 Devonshire St., Boston, Mass.
- BOSTON**—shock absorbers & spring grease, Knapp-Greenwood Co., 1000 Boylston St., Boston, Mass.
- BOSTON**—wind shields, The S. M. Supplies Co., 22-24 Lincoln St., Boston, Mass.
- BOUGIE EYQUEM**—spark plugs, Montgomery & Co., 105-107 Fulton St., N. Y. City.
- BOUGIE MERCEDES**—spark plug, Herz & Co., 203-205 Lafayette St., New York City, N. Y.
- BOULEVARD**—gauntlets, Detroit Leather Specialty Co., Inc., 909 Greenwood Ave., Detroit, Mich.
- BOUND BROOK**—bushings, Graphite Lubricating Co., Bound Brook, N. J.
- BOVAIRD**—stationary engines, BovaIRD & Co., Bradford, Pa.
- BOWDEN**—auto tires & wheels, Walter Bowden, 1619 Metropolitan Ave., Middle Village, L. I., N. Y.
- BOWER**—roller bearings, Bower Roller Bearing Co., 427-29 Valley St., Dayton, Ohio.
- BOWERS**—carburetors & pressure regulators, Gilbert Mfg. Co., New Haven, Conn.

- BOWES—hose couplings, Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Cleveland, Ohio.
- BOWSER—gasoline & oil storage outfits, S. F. Bowser & Co., Inc., Fort Wayne, Ind.
- BOYD-MOTOR—chemical fire engines for garages, James Boyd & Bro., 22nd St. bet. Vine & Race Sts., Philadelphia, Pa.
- BOYD-WAREHOUSE—chemical fire engines for garages, James Boyd & Bro., 22nd St. bet. Vine & Race Sts., Philadelphia, Pa.
- BRADFORD—motorcycles, luggage carriers for bicycles & motorcycles, The Bradford Co., Delaware Ave. & Tatnall Sts., Wilmington, Del.
- BRADLEY—auto scarfs, The Bradley Knitting Co., 19 Ninth St., Delavan, Wis.
- BRADLEY—forges & power hammers, C. C. Bradley & Son, 432 N. Franklin St., Syracuse, N. Y.
- BRADLEY—gasoline cycle motors and motorcycle carburetors, Bradley Motor Co., 268 Diamond St., Phila., Pa.
- BRAMPTON—auto chains & cycle chains, imported by Chas. E. Miller, 97-101 Reade St., N. Y. City.
- BRAND'S—pressure bellows & ferro-manganese, S. H. Brand Co., Chicago, Ill.
- BRAZIRON—brazing compound for cast iron, A. & J. Mfg. Co., 427 W. Randolph St., Chicago, Ill.
- BRAZE WELD—aluminum solder & brazing compound, The Cleveland Block Co., 1173 W. 11th St., Cleveland, Ohio.
- \*BRECKENRIDGE—gas bicycle lamps, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
- BREECH-BLOCK—spark plugs, The Standard Co., Torrington, Conn.
- BREECH-LOCK—wind shields, Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill.
- BREEZE—carburetors, fuel strainers & check valves, Breeze Carburetor Co., 240 South St., Newark, N. J.
- BREEZE—filter, Gilbert & Barker Mfg. Co., 80-82 Fourth Ave., N. Y. City.
- BREEZE—wind shields, Cartier-Chapman & Co., Ludington, Mich.
- BRENNAN—motors, carburetors, exhaust mufflers, auto transmission gears, stationary gasoline engines & gasoline marine motors, Brennan Motor Mfg. Co., 103 Grape St., Syracuse, N. Y.
- BRENNAN—tire sleeves, Fiskett & Co., 226-28 La Salle St., Chicago, Ill.
- BREWSTER—curtain fasteners & toilet cases, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- BRICHTSON—detachable treads, Brichtson Mfg. Co., Brookings, S. Dak.
- BRIDGEPORT—bicycle pedals, Standard Co., Torrington, Conn.
- BRIDGEPORT—motorcycle tire pumps, Bridgeport Brass Co., Cor. Fairfield & Holland Aves., N. Y. City, N. Y.
- BRIDGEPORT—moulding machines, metal, Bridgeport Foundry & Machine Co., Bridgeport, Conn.
- BRIDGEPORT—standard stains, The Bridgeport Wood & Finishing Co., New Milford, Conn.
- BRIGGS—battery connections & terminals, W. H. Briggs, 329 Chestnut St., Richmond Hill, N. Y.
- \*BRIGHAM—gasoline marine motors, Keeble & Scott, 313 Methuen St., Lawrence, Mass.
- BRIGHT JET—baking enamels, American Enamel Co., Providence, R. I.
- BRILL—gasoline marine motors & stationary gasoline engines, Brill Engine Works, Appleton, Wis.
- BRISCOE—radiators, fenders, tanks & hoods, Briscoe Mfg. Co., 1427-57 Woodward Ave., Detroit, Mich.
- BRISTOL—recording volt-meters, ammeters, motorcycle belts, steel, Bristol Co., Waterbury, Conn.
- BRITELITE—inspection lamps, American Enamel Co., Providence, R. I.
- \*BROCK—carburetors, A. A. Brock, 86 La Salle St., Chicago, Ill.
- BROCK—tire cases, The Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, O.
- BROGA—curtain fasteners & fasteners for mats, leggings & tire covers, Broga Automatic Fastener Co., 368 W. Fayette St., Syracuse, N. Y.
- BRO-GOR—anti-skid chains & tire pressure gauges, Brockett & Gorham, Marion, O.
- BROOKE-AIRLESS—automobile & motorcycle tires, Brooke Airless Tire, P. O. Box 738, Denver, Colo.
- BROOKE—carburetors, The Demster Machlery Co., 16th & Walnut Sts., Kansas City, Mo.
- BROOKS—cleaning compound, Clarence Brooks & Co., 249-277 Chestnut St., Newark, N. J.
- \*BROPHY—handwove endless belt, Brophy Belting & Supply Co., 2 Spring Ave., La Grange, Ill.
- BROWN—anti-skid chains & ratchet chain tools, J. C. Brown Mfg. & Garage Co., Butler, Ind.
- BROWN & BARLOW—carburetors, imported by Royal Motor Works Co., Worcester, Mass.
- BROWN—folding stools, Brown Folding Stool Co., 27 Dock Square, Boston, Mass.
- BROWN—gasoline automobile motors, Chas. T. Brown, 79 Dearborn St., Chicago, Ill.
- BROWN—gasoline marine motors, The B. F. Brown Gas Engine Co., 402 S. Franklin St., Syracuse, N. Y.
- BROWN—pressure gauges, portable washrack lights, valve lifting tools, wrenches, valve grinding tools & grease & oil guns, The Brown Co., 1071-73 S. Clinton St., Syracuse, N. Y.
- BROWN—pyrometers, Edward Brown & Son, Phila., Pa.
- BROWNE—bucket funnels, Browne's Automatic Funnel Bucket Co., 3219 S. Figueroa St., Los Angeles, Cal.
- BROWN—weldless chains, Bridgeport Chain Co., Bridgeport, Conn.
- BROWNELL—gasoline motors, F. A. Brownell Motor Co., 634-666 Lexington Ave., Rochester, N. Y.
- \*BROWNE'S—absorbent wiping towels, Geo. B. Brooks, 297 Canal St., Providence, R. I.
- BROWN'S—inner tubes, Brown's Perfection Tube Co., 125 Watts St., N. Y. City.
- BROWNIE—gasoline marine motors, The B. F. Brown Gas Engine Co., 402 S. Franklin St., Syracuse, N. Y.
- BROWNS—adjustable pulley, Walton Motor Co., Inc., Broadway & Merrick Road, Lynbrook, Long Island, N. Y.
- BROWN'S—steering apparatus, auto, Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass.
- \*BRYAN—carburetors, Hercules Auto Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill.
- BUCHET—cycle motors, imported by Prospect Motor Co., 1900 Broadway, N. Y. City.
- BUCKEYE—dies & stocks, The Hart Mfg. Co., 1362 E. 3rd St., N. E., Cleveland, O.
- BUCKEYE—hat hangers, The Central Brass & Fixture Co., Springfield, O.
- BUCKEYE—jacks, Buckeye Jack Mfg. Co., Alliance, Ohio.
- BUCKEYE CLEANSER—automobile soap, J. P. Davies Co., Dayton, Ohio.
- BUCKEYE—sand blasts, brazing & soldering torches, oil furnaces & welding equipment, Walter MacLeod & Co., Cincinnati, O.
- BUCKEYE—stationary gas and steam engines & blue print machines, Buckeye Engine Co., Salem, Ohio.
- BUCKLAND—fire extinguishers, Buckland Fire Extinguisher Co., 575 Lyell Ave., Rochester, N. Y.
- BUDA—automobile jacks, The Buda Mfg. Co., Chicago, Ill.
- BUEK'S—metal melting furnaces, Frictionless Metal Co., Chattanooga, Tenn.
- BUFFALO—carburetors, Buffalo Carburetor Co., Grand River Ave. & Stanton St., Detroit, Mich.
- BUFFALO—cutting oil, White Refining Co., 77 Main St., Buffalo, N. Y.

**BUFFALO**—forges, vertical drills, punches & shears, Arthur C. Harvey Co., 374 Congress St., Boston, Mass.

**BUFFALO**—gasoline marine & auto motors, Buffalo Gasoline Motor Co., 1280-1290 Niagara St., Buffalo, N. Y.

**BUFFALO**—lubricators, grease cups, oil pumps, oil cups, Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.

**BUFFALO**—machinery, Buffalo Forge Co., Buffalo, N. Y.

**BUFFALO**—metal polish, Ulrich & Co., 227-233 E. North St., Buffalo, N. Y.

**BUFFALO**—screw drivers, Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.

**BUFFALO**—vulcanizers, electric, Buffalo Electric Vulcanizer Co., 122 Erie Co. Bank Bldg., Buffalo, N. Y.

**BUGGYABOUT**—auto steering apparatus for light cars, Widmer Machine Works, Inc., 292-94 E. 135th St., N. Y. City.

**BULLARD**—speed indicator with odometer comb, Bullard Specialty Co., Springfield, Mass.

**BULL DOG**—ignition batteries, Northwestern Storage Battery Co., 140 Mason St., Milwaukee, Wis.

**BULL DOG**—pump connections, Stevens & Co., 375 Broadway, N. Y. City.

**BULL DOG**—steel wire, fan & oiler belts, New York Wire & Spring Co., 586-8 Washington St., Hoboken, N. J.

**BULL DOG**—vises, Prentiss Vise Co., 44 Barclay St., N. Y. City.

**BULLDOG**—wind shields, M. P. Flanders, 61 Main St., Merrimac, Mass.

**BULLET PROOF**—inner tube protector, webbing for fan belts, web straps for holding hoods, trunks, etc., Waban Webbing Co., 16 South St., Boston, Mass.

**BULL PUP**—gasoline marine motors, Consolidated Carpet Sewing Machine Co., Bridgeport, Conn.

**BULLY**—oil, soap, gear compound & cup grease, New York Oil & Paint Co., 128 Maiden Lane, N. Y. City.

**BULTMAN**—steering gear, transmission & compensating gears, F. H. Bultman Co., 2108 Superior Ave., N. W., Cleveland, O.

**BURDICK**—gasoline marine motors and carburetors, Burdick Motor Car Co., Eau Claire, Wis.

**BURDICT**—bolt heading & threading machines, Howard Iron Works, Buffalo, N. Y.

**\*BURGESS**—boat propellers, W. Starling Burgess, Marblehead, Mass.

**BURGESS**—gasoline automobile motors and body springs, Chas. H. Burgess, Wenona, Ill.

**BURLINGTON SIMPLEX**—grease & oil guns, Raymond C. Agner & Co., Burlington, Wis.

**BURNHAM**—spark plugs, Burnham Spark Plug Co., East Edgecomb, Me.

**\*BURNAM**—tire protectors, Huntsville Motor Car Co., Huntsville, Ala.

**BURN-BOSTON**—ignition batteries, Burn-Boston Battery & Mfg. Co., 10 Doane St., Boston, Mass.

**BURNELLS**—anti-skid devices, Queen Mfg. Co., Webster City, Iowa.

**\*BURNET**—auto leaf springs, Burnet Compound Spring Co., 738 Broad St., Newark, N. J.

**BURNLEY**—solder, Burnley Battery & Mfg. Co., North East, Pa.

**BURNSHINE**—metal polishes, J. C. Paul & Co., 59 Dearborn St., Chicago, Ill.

**BURR**—automatic safety tackle blocks, Burr Mfg. Co., 2108 Superior Ave., New York.

**BURR**—keyseating & broaching machines & cold cutting off saws, John T. Burr & Son, 429-31 Kent Ave., Brooklyn, N. Y.

**\*BURROWES**—spare wheels, wind shields & license plate hangers, The E. T. Burrowes Co., Portland, Me.

**BUSH**—radiators, hoods, automobile fenders & tanks, Bush Mfg. Co., 81 Commercial St., Hartford, Conn.

**BUSHEY**—demountable rims, E. J. Bushey, 1777 Broadway, N. Y. City.

**BUTTERFIELD**—taps, dies and screw plates, Butterfield & Co., Derby Line, Vt.

**BYAM**—demountable rims, Eber C. Byam, 45 Lake St., Chicago, Ill.

**BYERLY**—automatic driveway gates, Cargill Mfg. Co., W. End Buttes Ave., Columbus, Ohio.

## C

**C C**—oil cans, The Delphos Mfg. Co., Delphos Ohio.

**C C**—leaf springs, Cleveland-Canton Spring Co., Canton, O.

**C. D. S.**—gaskets, Chicago Die & Stamping Co., Ravenwood Station, Chicago, Ill.

**C-F**—air compressors, The Carruthers-Fithian Clutch Co., Grove City, Pa.

**C. C. & CO.**—wadding, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.

**C & F**—screw drivers, The Cassady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.

**C-H**—lamp lighters, Haase Motor Works, 1017 Lloyd St., Milwaukee, Wis.

**\*C. M. C.**—water motors & garage tire pumps & bench grinders, Cherington Mfg. Co., Waukegan, Ill.

**C M**—malleable iron castings, The Columbus Malleable Casting Co., 770 Jefferson Pl., Columbus, O.

**C. O. T.**—acid cure solution & fluid, rubber plugs, patches, taps, cycle chain lubricants, waste & aluminum lacquer, Chas. O. Tingley & Co., Rahway, N. J.

**C. R. U.**—brazing salt, Chas. R. Uebelmesser Co., Inc., Bayside, L. I., N. Y.

**C-S**—electric lamp adapters, inspection lamps, gauge lamps & lamp connectors, Culver-Stearns Mfg. Co., 34 Southbridge St., Worcester, Mass.

**C-Yacht**—bidge pumps, folding lavatories, ventilators & deck plates, gasoline strainers & fuel tanks for boats, Goblet-Dolan Co., 30 Old Slip, N. Y. City.

**CACO**—power boat whistles, Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y.

**CADILLAC**—mica plug cores, Hub Auto Supply Co., Middletown, Conn.

**CADY**—gasoline marine motors & auto motors, C. N. Cady Co., Inc., Canastota, N. Y.

**CAEDO**—oil stones, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.

**CALCUTTS**—fan, pump & oiler belts, Gardner Mfg. Co., 5637-39 Ohio St., Chicago, Ill.

**CALDER'S**—emery wheel dressers, George H. Calder, Lancaster, Pa.

**CALDWELL'S**—tire protectors & lacquer, "CALDWELL'S ELECTROLINE" — metal polish & "CALDWELL'S POLISH VE-

**\*NEER**—wood polish, E. P. Caldwell Co., 219 E. Fourth St., Waterloo, Ia.

**CALIFORNIA**—vehicle batteries, United Electric Storage Battery Co., 2107 Pine St., St. Louis, Mo.

**CALLAHAN'S NON-CORROSIVE** — solder, CALLAHAN'S OLD RELIABLE—metal cement, CALLAHAN'S ANTI-SLIP—belt dressing, Geo. Callahan & Co., 218 Front St., N. Y. City.

**CALMON'S**—auto pneumatic tires, Calmon Asbestos & Rubber Works of America, 1693 Broadway, N. Y. City.

**\*CAM**—carbon removers, The Murphey Co., 619 Fifth St., Sioux City, Iowa.

**CAMERON**—ball bearings, speed change gears & gasoline auto engines, F. F. Cameron Co., Hinsdale, N. H.

**CAMPBELL**—crank handle covers & leather tool cases, Perkins-Campbell Co., 622 Broadway, Cincinnati, O.

**CAMPBELL'S**—motor boat varnish, Carpenter-Morton Co., Boston, Mass.

**CANCOS**—metal polish, Cancos Mfg. Co., 146 N. 2nd St., Phila., Pa.

**CANDY**—carbide (crude & refined), Acetylene Gas Illuminating Co., 405 Broome St., N. Y. City.

- CANNE—anti-skid devices, H. L. Canne, Milford, Pa.
- CANNON—oilers, R. E. Bloomer, Keithsburg, Ill.
- CAPITAL—marine gasoline motors, Fifield Bros. Co., 337 Water St., Augusta, Me.
- CAPITAL—stationary engines, Capital Gas Engine Co., West 21st St. & the Belt Ry., Indianapolis, Ind.
- CAPITOL—gasoline cans, The Capitol Hill Garage Co., 321 Corona St., Denver, Colo.
- CAPITOL—gasoline marine engines, Auto Engine Works, Rice & Fuller Sts., St. Paul, Minn.
- CAPPER'S—high speed & special tool steel, Damascus Crucible Steel Casting Co., New Brighton, Pa.
- CARBOFLYNT—abrasives, American File Sharpener Co., 237 Broadway, N. Y. City.
- CARBONDALE—chamois & sponges, Carbondale Calcium Co., Carbondale, Pa.
- \*CAR-BO-NIT—carbon remover, R. W. Willits, Joy, Ill.
- CARBONLESS—ferro-vanadium, cupro-vanadium & aluminum-vanadium alloys, American Vanadium Co., Frick Bldg., Pittsburgh, Pa.
- CARBONALL—paints, The Good Paint Co., 1709-11 Austin Ave., Chicago, Ill.
- CARBOSOLVENT—carbon removers, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- CARDINAL—cushion springs, Barber Mfg. Co., Anderson, Ind.
- CARDINAL—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.
- CAREY'S—steam pipe & boiler coverings & factory roofing, Phillip Carey Mfg. Co., Lockland, Ohio.
- CAREY—wind shields, Motor Specialty Co., 870 Woodward Ave., Detroit, Mich.
- CARLETON—canoes, Carleton Canoe Co., 700 Main St., Old Town, Me.
- \*CARLSON—mufflers, Webster Muffler Co., Galesburg, Ill.
- CARON—road guides, J. Victor Caron, Haverhill, Mass.
- CARPRINGCO—auto tires, New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.
- CARR—boring bars, lathe and planer tools & tool holders, Henry G. Thompson & Son Co., New Haven, Conn.
- CARRICO—gasoline auto engines, De Tamble Motors Co., Anderson, Ind.
- CARTER—carburetors & gasoline strainers, Carter Carburetor Co., 914-18 N. Market St., St. Louis, Mo.
- CARTER-LEWIS—carburetors, Carter & Lewis, 41 Westfield Ave., Elizabeth, N. J.
- CARTRIDGE—coils, timers, spark plugs & ignition cable, Cartridge Coil Co., Lafayette, Ind.
- CARY'S—steel mats for running boards or steps, Cary Mfg. Co., 19 & 21 Roosevelt St., N. Y. City.
- CASE—boiler & radiator compounds, Globe boiler Compound Co., Whipple Bldg., Binghamton, N. Y.
- \*CASE—cranes & electric & hand hoists, Case Mfg. Co., Columbus, O.
- CASEY CASE—tire protector, The Case Casting Co., Mt. Pleasant, Ia.
- CASGRAIN—speed indicator (Auto), Couch & Seeley Co., 10 Thacher St., Boston, Mass.
- CASSADY—screw drivers, The Cassidy-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- CAST STEEL—metal cements, The Clark Cast Steel Cement Co., Shelton, Conn.
- CATARACT AUTO-VEHICLE WASHER—nozzle & mop, Cataract Auto-Vehicle Washer Co., Topeka, Kans.
- CATARACT—bench lathes, Hardinge Bros., 3133-41 Lincoln Ave., Chicago, Ill.
- CAVALRY—motorcycle saddles, H. & F. Messenger Mfg. Co., 1801-03 First Ave., N. Y. City, N. Y.
- CAVITO—under water exhaust, Cavito Underwater Exhaust Co., Louis & Ottawa Sts., Grand Rapids, Mich.
- CEDAROLEUM—grease, rust preventative including lacquers for tool & machinery & cleansing compound, Cedaroleum Co., Perkinsville, Vt.
- CELFOR—drill chucks & twist drills, Celfor Tool Co., Chicago, Ill.
- CENTAUR—steering wheels, Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.
- CENTER FIRE—spark plugs, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.
- CENTURY—cushion springs, D'Arcy Spring Co., 115 Main St., Kalamazoo, Mich.
- CENTURY—gasoline auto motors & alternating current motors, Century Electric Co., 19th & Olive Sts., St. Louis, Mo.
- CENTURY—oil & grease, Davey & Co., 2600-08 Grand Ave., Chicago, Ill.
- CENTURY—wind shields, J. Stewart Smith, 1779 Broadway, N. Y. City.
- CHACES—oil cans, Consolidated Fruit Jar Co., New Brunswick, N. J.
- \*CHAININE—chain & gear grease, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
- CHALLENGE—emery wheels, Challenge Machine Co., Phila., Pa.
- CHALLENGE—grey iron castings, The Challenge Machinery Co., Grand Haven, Mich.
- CHALLENGE—screw drivers, Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
- CHALLENGE—tires, pneumatic, auto & cycle, Boston Tire & Rubber Co., 134 Friend St., Boston, Mass.
- CHAMBERS—bolt & rivet clippers, Chambers Bros. Co., Phila., Pa.
- CHAMPION—belt dressing & cotton waste, Alonzo K. Lynch, Inc., 310-12 Flushing Ave., Brooklyn, N. Y.
- CHAMPION—drill rods, Pittsburg Tool Steel Wire Co., Monaca, Pa.
- CHAMPION—gasoline storage outfits, Optenburgh Iron Works, Sheboygan, Wis.
- \*CHAMPION—hammers, power, Beaudry & Co., Inc., 141 Milk St., Boston, Mass.
- CHAMPION—hand bellows, Edward Faro, 3626 62nd St., Chicago, Ill.
- CHAMPION—lathes, The Champion Tool Works Co., Cincinnati, Ohio.
- CHAMPION—magnetos, spark plugs & ignition cable, The Champion Co., 36 Whittier St., Boston, Mass.
- CHAMPION—motorists' coats, Mischel Bros., 15 E. 12th St., N. Y. City.
- CHAMPION—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.
- CHAMPION—pressure & fan blowers, forges, post drills & exhaust fans, Champion Blower & Forge Co., Lancaster, Pa.
- CHAMPION—ratchet wrenches & spark plug wrenches, Syracuse Wrench Co., Franklin & Water Sts., Syracuse, N. Y.
- CHAMPION—screw drivers, Union Hardware Co., Torrington, Conn.
- CHAMPION—storage battery, Hector Macrae, 314 St. Paul St., Baltimore, Md.
- CHAMPION—storage outfits, engine cleaners, garage tire pumps, whistle outfits for motor boats & electric air compressors, Cleveland Faucet Co., 708 Frankford Ave., N. W., Cleveland, O.
- CHAMPION—tool holders, expanding mandrels, vise & tool stands, Western Tool & Mfg. Co., Springfield, Ohio.
- CHANDLER—anti-skid chains, Diamond Pulvs Co., 1331 Intervale Ave., N. Y. City.
- CHANDLER—metal goods, stampings, nameplates, steel stamps, letters & figures, The Chandler Co., Springfield, Mass.
- CHANNON—auto & motor boat tool kits, H. Channon Co., Market & Randolph Sts., Chicago, Ill.
- CHAPMAN—ball bearings, Chapman Ball Bearing Co., 40 Bristol St., Boston, Mass.
- CHAPMAN—emery grinders, Chapman Engine Works, Marcellus, Mich.



- CHARTER—gas & gasoline stationary engines, Charter Gas Engine Co., Sterling, Ill.
- CHARTER—spark plugs, lubricators, terminals, sight feeds, Charter & Co., Hoopes-town, Ill.
- CHARTER OAK—bolts, The Franklin Moore Co., Winsted, Conn.
- CHARTER OAK—leather for trimming, Bridgeport Patent Leather Mfg. Co., Bridgeport, Conn.
- CHASE—upholstery materials, L. C. Chase & Co., 89 Franklin St., Boston, Mass.
- CHELSEA—auto & marine clocks, Chelsea Clock Co., 16 State St., Boston, Mass.
- CHELSEA—files & rasps, Chelsea File Works, Norwich, Conn.
- CHERRY HEAT—welding compound, Cortland Welding Compound Co., Cortland, N. Y.
- CHESTER FLAKE—graphite, Walter H. Carpenter Co., 39 Cortland St., N. Y. City.
- CHEX—combination switch lock, The Combination Switch Lock Co., 406 German-American Bank Bldg., Buffalo, N. Y.
- CHICAGO—automobile jacks, Wm. E. Pratt Mfg. Co., 91 Lake St., Chicago, Ill.
- CHICAGO—goggles, Chicago Eye Shield Co., 128-134 S. Clinton St., Chicago, Ill.
- CHICAGO—ignition batteries, Chicago Battery Co., 2600-10 Wabash Ave., Chicago, Ill.
- CHICAGO—polishing, buffing & emery wheels, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.
- CHICAGO-MATIC—wind shields, Chicago Wind Shield Co., 235 Johnston St., Chicago, Ill.
- CHILDS—fire extinguishers, O. J. Childs Co., 48 and 50 Liberty St., Utica, N. Y.
- CHOICE—oil cans, The Delphos Mfg. Co., Delphos, O.
- CHRISTENSEN—air compressors & gasoline auto engines, The Christensen Engineering Co., 341-47 30th St., Milwaukee, Wis.
- CHRISTMAN—inspection lamps, Penn Auto Supply Co., N. E. cor. Broad & Race Sts., Phila., Pa.
- CIGLIA—shock absorbers, Behrmann-Baron Co., 1777-79 Broadway, N. Y. City.
- CINCH—plugs (tire), Auto Goods Co., 41 Bowker St., Boston, Mass.
- CINCINNATI—gear cutters, Cincinnati Gear Cutting Machine Co., Cincinnati, Ohio.
- CINCINNATI—lathe chucks, Cincinnati Chuck Co., Spring Grove Ave., & Sassafras St., Cincinnati, O.
- CINCINNATI—lathes, Cincinnati Lathe & Tool Co., 2730-32 Spring Grove Ave., Cincinnati, O.
- CINCINNATI—metal shapers, The Cincinnati Shaper Co., Elam St. & Garard Ave., Cincinnati, Ohio.
- CINCINNATI—paints & varnishes, Cincinnati Color Co., 8th, Evans & Whately Sts., Cincinnati, Ohio.
- CINCINNATI—spark plugs, C. Biederman, 1555 Knox St., Cincinnati, Ohio.
- CINCINNATI—tires & inner tubes, The Cincinnati Rubber Tire Co., 522 Main St., Cincinnati, O.
- CIRCLE—motorists' caps, Levine Bros., 105 Bleeker St., N. Y. City.
- CIRKLE-FYRE—spark plugs, Mica Core Mfg. Co., 442 E. 166th St., N. Y. City.
- CISCO—pocket ammeters & voltmeters, inner tubes, tire cements & oil, C. J. Smith & Co., St. Paul, Minn.
- CLAIR—auto pump connections, Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.
- CLARK—auto heaters, Chicago Flexible Shaft Co., Chicago, Ill.
- CLARK'S—screw drivers & expansive bits, R. H. Brown & Co., New Haven, Conn.
- \*CLAUS—gasoline marine motors, International Motor Co., 868-890 Military Ave., Detroit, Mich.
- CLAYTON—air compressors & garage tire pumps, The Clayton Air Compressor Works, 115 Broadway, N. Y. City.
- CLAYTON'S—tire valves, F. T. Clayton, Sandwich, Mass.
- CLEANEASY—auto body soap & hand cleansing compound, W. R. Winn, 143 Maiden Lane, N. Y. City.
- CLEANOLA—auto finish & auto body cleansing compound, The Cleanola Co., 1101 Fulton Bldg., Pittsburg, Pa.
- CLEAN-PAW—hand cleansing compounds, Frost Stamp & Stationary Co., 505 Main St., Worcester, Mass.
- CLEANZUM—hand soap, The White & Bagley Co., Worcester, Mass.
- CLEAR VIEW—acetylene boat lamps, American Acetylene Stove Co., 504 Masonic Temple, Minneapolis, Minn.
- CLEMONS—belt sanders & rubbing & polishing machines, Clemons Machine Co., Hornell, N. Y.
- CLEVELAND—automatic electric time switches, Abbott Mfg. Co., 9212-14 Central Ave., S. E., Cleveland, Ohio.
- CLEVELAND—auto tires, The Cleveland Puncture Proof Tire Co., 1355 N. High St., Columbus, O.
- CLEVELAND—bicycles, The Pope Mfg. Co., Hartford, Conn.
- CLEVELAND—boring machines, center grinders, emery & valve grinding machines, hammers, pneumatic tools & reamers, The Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Cleveland, O.
- CLEVELAND—bow sockets & top hardware, Cleveland Hardware Co., 45th St. & Lakeside Ave., Cleveland, Ohio.
- CLEVELAND—nuts & bolts, Kirk-Latty Mfg. Co., W. Madison Ave. & W. 84th St., Cleveland, Ohio.
- CLEVELAND—planers, Cleveland Planer Works, Cleveland, Ohio.
- CLEVELAND—power hack saws, The Cleveland Block Co., 1173 W. 11th St., Cleveland, O.
- CLEVELAND—spark plug protectors, battery connections & terminals, National Steel Products Co., Lorain, O.
- \*CLEVELAND—spark plugs, battery connections & plug protectors, Cleveland Spark Plug Co., Cleveland, Ohio.
- CLEVELAND—speed indicators, Cleveland Speed Indicator Co., 1806 Euclid Ave., Cleveland, O.
- CLEVELAND—rubber tubing, gas bags, bumpers, mats & matting, Mechanical Rubber Co., C. & P. R. R. near Nickel Plate R. R., Cleveland, Ohio.
- CLEVELAND—varnishes, Cleveland Varnish Co., 3111 E. 87th St., Cleveland, Ohio.
- CLEVELAND SHOOT-A-FLAME—spark plugs, National Steel Products Co., Lorain, O.
- CLIFTON—carbon removers, Clifton Mfg. Co., Boston, Mass.
- CLIFTON—gasoline marine engines, Clifton Motor Works, 229 E. Clifton Ave., Cincinnati, O.
- CLIMAX—acetylene gas lamps, Autolyte Mfg. Co., 26 Warren St., N. Y. City, N. Y.
- CLIMAX—grease, Chas. F. Sweet, Inc., 20 Ford St., Hartford, Conn.
- CLIMAX—gasoline automobile motors & transmission gears for autos, Climax Electric Works, New Salem, Mass.
- CLIMAX—grease guns, Climax Specialty Co., Seneca Falls, N. Y.
- CLIMAX—leather belting, Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.
- CLIMAX—tires, pneumatic, auto & cycle, Boston Tire & Rubber Co., 184 Friend St., Boston, Mass.
- CLIMAX—welding compound, Cortland Welding Compound Co., Cortland, N. Y.
- CLIMAX—SYNOVIA—grease, Fiske Bros. Refining Co., 24 State St., N. Y. City, N. Y.
- CLINCHER—machinists' vises, Massey Vise Co., 9-11 W. Michigan St., Chicago, Ill.
- CLINGFASTA—cements & vulcanizing solution, Brooklyn Rubber Co., 397-401 Summer Ave., Brooklyn, N. Y.
- \*CLING-TIGHT—storm aprons & lap robe holders, Beebe-Elliott Co., Racine, Wis.



- CLINTON—gasoline marine motors, Greenhaigh Engine & Machine Works, 550-552 Central Ave., Newark, N. J.
- CLIP—misc. valves, The Lunkenheimer Co., Cincinnati, O.
- CLIPPER—gasoline marine motor, Clipper Lawn Mower Co., Dixon, Ill.
- CLOVER—valve grinding compound, Clover Mfg. Co., 151 E. 126th St., N. Y. City.
- CLOVERLEAF—clocks, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- CLUM & ATKINSON—castings, Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.
- COCHECO—leather & belting, I. B. Williams & Sons, Dover, N. H.
- COE—sensitive drills, St. Louis Machine Tool Co., 1405 S. 7th St., St. Louis, Mo.
- COES—wrench (Auto & motorcycle), Coes Wrench Co., Worcester, Mass.
- COLT—drill chucks, Standard Machinery Co., Mystic, Conn.
- COLBURN—boring & turning mills, Colburn Machine Tool Co., Franklin, Pa.
- COLD ELAST—oil automobile lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- COLGAN—oil & grease, Colgan Mfg. & Supply Co., 42 South St., N. Y. City.
- COLGAN'S—monogram & brass radiator signs, The J. W. Colgan Co., 509 Sudbury Bldg., Boston, Mass.
- COLGAN'S PEERLESS & COLGAN'S CREST—metal polish & COLGAN'S AL-WAISTITE & COLGAN'S RELIABLE—sheet packing, Colgan Mfg. & Supply Co., 42 South St., N. Y. City.
- COLLINS—brass wind shields, G. A. Collins & Son, Akron, Ohio.
- COLLIS—twist drills, American Specialty Co., 834-35 Monadnock Bldg., Chicago, Ill.
- COLONIAL—auto oils & gear case compound, Borne-Scrymser & Co., 80 South St., N. Y. City.
- COLONIAL—files & rasps, Colonial File Co., 167-70 Teneau St., Neponset, Mass.
- COLONIAL—leather for trimming, Badger State Tanning Co., Shelboyan, Wis.
- COLO—gear case compounds, Borne-Scrymser & Co., 80 South St., N. Y. City.
- COLT—milling machines, Asa S. Cook Co., 80 Huyshope Ave., Hartford, Conn.
- COLT'S—clamps for auto body builders & automobile jacks, Batavia Clamp Co., 103 Center St., Batavia, N. Y.
- COLUMBIA—ammeters, voltmeters, battery connections, sparking coils, portable electric lights, National Carbon Co., Lock Drawer "L," Cleveland, O.
- COLUMBIA—automobile trimmings, Wm. H. Horstmann Co., 5th & Cherry Sts., Phila., Pa.
- COLUMBIA—auto tops, Columbia Tire & Top Co., 31 Irvington St., Boston, Mass.
- COLUMBIA—bar & wire solder, Columbia Smelting & Refining Works, 365 West St., N. Y. City, N. Y.
- COLUMBIA—bicycles, The Pope Mfg. Co., Hartford, Conn.
- COLUMBIA BRAND—babbitt metal & solder, Columbia Smelting & Refining Works, 365 West St., N. Y. City.
- COLUMBIA—burner cleaners, J. B. Carroll, 217 W. Illinois St., Chicago, Ill.
- COLUMBIA—calipers, E. G. Smith & Co., Columbia, Pa.
- COLUMBIA—cotton pins, Hindley Mfg. Co., Valley Falls, R. I.
- COLUMBIA—lock nuts, Columbia Nut & Bolt Co., Bridgeport, Conn.
- COLUMBIA—metal polish, Frederic B. Stevens, Detroit, Mich.
- COLUMBIA—oil & gas bicycle lamps, acetylene auto lamps & acetylene gas generators, Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill.
- COLUMBIA—screw drivers, The Cassady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- \*COLUMBIA—shock absorbers, Frank Doront, 68 Pearl St., Paterson, N. J.
- COLUMBIA—steel, Columbia Steel & Shafting Co., Pittsburg, Pa.
- COLUMBIA—tire pumps, Judd & Leland Mfg. Co., Clifton Springs, N. Y.
- COLUMBIA IGNITER—dry cells, National Carbon Co., Lock Drawer "L," Cleveland, Ohio.
- COLUMBIAN—stuffing boxes & boat propellers, bronze castings & steering apparatus, boat, Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y.
- COLUMBUS—gasoline auto motors, marine motors & steering apparatus for trucks, Columbus Screw & Machine Co., 244 Kaiser St., Columbus, Ohio.
- \*COLUMBUS—stationary engines, Columbus Machine Co., Columbus, Ohio.
- COLVIN—hammers, Greene, Tweed & Co., 109 Duane St., N. Y. City.
- COLZA—boiler & radiator compound, Colza Chemical Co., 213 Mutual Life Bldg., Buffalo, N. Y.
- COMBAT IGNITER—ignition batteries, Commercial Battery Co., 718 Jackson Blvd., Chicago, Ill.
- COMBAT—ignition batteries, storage, The Hall Storage Battery Co., 1056-60 St. Clair Ave., N. E., Cleveland, O.
- \*COMCO—camping outfits, Camp Outfit Mfg. Co., 160 Water St., N. Y. City.
- COMET—electric burners, R. E. Dietz Co., 60 Laight St., N. Y. City.
- COMET—electric lamp adapters, R. E. Dietz Co., 60 Laight St., N. Y. City.
- COMET—gasoline auto & marine motors, Comet Motor Works, 438 W. Madison St., Chicago, Ill.
- COMET—spark coils, The Duplex Coil Co., Fond du Lac, Wis.
- COMET—spark plugs, The Oakes & Dow Co., 15 Chardon St., Boston, Mass.
- \*COMET—vulcanizers, Comet Mfg. Co., Flan-dreau, S. D.
- COMFORT—nasal-filter, Universal Supply Co., 438 Globe Bldg., St. Paul, Minn.
- COMMODORE—oil, Miller & Starr, 250 Greene St., Brooklyn, N. Y.
- COMMODORE—spray hoods & guards, The Pneumatic Mfg. Co., 2-3 South St., New York City.
- COMMON SENSE—spark plugs, C. F. Split-dorf, 261-265 Walton Ave., N. Y. City.
- COMMON SENSE—tool kits, The Whitaker Mfg. Co., 509 W. Monroe St., Chicago, Ill.
- COMMON SENSE—wind shields, Sprague Umbrella Co., Norwalk, Ohio.
- COMO—waterproof tents, duffle bags, gun cases, holsters, buckets, etc., Camp Outfit Mfg. Co., 160 Water St., N. Y. City.
- COMPETITION—insulating tapes, New York Insulated Wire Co., 114 Liberty St., Boston, Mass.
- COMPOUND—water gauge glasses, Schaeffer & Budenberg Mfg. Co., 963-5 Kent Ave., Brooklyn, N. Y.
- COMPOUNDER—oils, Hinds & Coon, 124-26 Pearl St., Boston, Mass.
- COMPRESSION—piston seating compounds, J. F. Bornschein & Co., 2351 Indiana Ave., Chicago, Ill.
- \*COMSTOCK—shock absorbers, Comstock Shock Absorber Co., 1777 Broadway, New York City, N. Y.
- CONNECTICUT—oils, The Connecticut Oil Co., Waterbury, Conn.
- CONNECTICUT—spark coils, timers, switches, voltmeters, ammeters, voltmeters, distributors, magnetos, portable electric lights, current indicators & shock absorbers, Connecticut Tel. & Elec. Co., 50 Britannia St., Meriden, Conn.
- CONNECTICUT—trunk racks, Connecticut Steel & Wire Co., 57-61 Allyn St., Hartford, Conn.
- CONOVER—jacks, E. K. Conover, 675 E. 23rd Paterson, N. J.
- CONSTRUCTOR—auto & boat clutches, Warner Clutch Co., Railway Exchange Bldg., Chicago, Ill.

- CONSTRUCTION, MANAGEMENT & CARE OF MOTORCYCLES (publication), The Keller & Risque Motor Co., 20 W. 3rd St., St. Paul, Minn.
- CONSOLIDATED—cycle package delivery vans, Consolidated Mfg. Co., Toledo, Ohio.
- CONTINENTAL—detachable auto tires and demountable rims, Continental Caoutchouc Co., 1788-90 Broadway, N. Y. City.
- CONTINENTAL—motors, (auto & marine), Continental Motor Mfg. Co., Muskegon, Mich.
- CON-TROM-E-TIER—potential control, Leece-Neville Co., Cleveland, Ohio.
- COOK—disc grinders, National Metallic Packing Co., Oberlin, Ohio.
- COOK—milling machines, Asa S. Cook Co., 80 Huyslope Ave., Hartford, Conn.
- COOK'S—linoleum & cork carpet, trimming leather & top materials, Trenton Oil Cloth & Linoleum Co., Trenton, N. J.
- COOK-PEARY—anti-freezing solutions, Hazen-Brown Co., 100 South St., Boston, Mass.
- COOK'S—goggles, Iowa Optical Co., New London, Iowa.
- COOKSON'S SECURITY—electric switches, Ideal Machine Works, 255-57 39th St., Brooklyn, N. Y.
- COOPER—automobile & garage heaters, Cooper Heater Co., Dayton, O.
- COPELANDS—calipers & dividers, Thos. F. Eagen, Worcester, Mass.
- COPPER KING—fire extinguishers, Badger Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis.
- COPPER KING—spark plugs, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- Chemical Mfg. Co., 143 Reed St., Milwaukee.
- COPPOCK—gasoline automobile motors, Decatur Motor Car Co., Decatur, Ind.
- CORBIN DUPLEX—coaster brake, Corbin Screw Corporation, New Britain, Conn.
- CORDESMAN-RECHTIN—band saws, boring machines, lathes, planers, shapers, etc., Cordesman-Rechtin Co., Cincinnati, Ohio.
- CORE OIL—core compounds, cupolas, foundry riddles & sieves & plumbago, Frederic B. Stevens, Detroit, Mich.
- CORMACK—grease & oil guns (Combination), M. H. Cormack & Co., Motor Mart Bldg., N. Y. City.
- CORNELL—pumps, hand tire auto, The Fowler Brass Works, Inc., 2333-35 Wabash Ave., Chicago, Ill.
- CORONA—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- \*CORP—vulcanizers, Corp Bros., 37 Sabin St., Providence, R. I.
- COSCOLEUM—auto oils, Curry Oil & Supply Co., Boston, Mass.
- COSCO—gear case grease, Curry Oil & Supply Co., Boston, Mass.
- COSMIC—rust preventatives, E. F. Houghton & Co., 240 W. Somerset St., Phila., Pa.
- COSTELLO—foot power presses, Leonard Mfg. Co., Providence, R. I.
- COTTA—transmissions & lever sets, Cotta Transmission Co., 814-18 S. Main St., Rockford, Ill.
- COUPE—oil automobile lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- COURTNEY—detachable auto tires, Courtney Rubber Co., 1976 Broadway, New York City, N. Y.
- COVENTRY WORMROLLER—automobile chains, imported by S. Hoffnung & Co., Ltd., 116 Broad St., N. Y. City.
- COVER—rubber goggles, H. S. Cover, South Bend, Ind.
- COVERT—auto axles, transmission gears, levers, speed change gears & rubber fittings & parts, Covert Motor Vehicle Co.,
- \*COWLES—carburetors, E. P. Cowles, 123 Belmont St., Warren, O.
- THE COX—bumpers & clocks, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- COX GEAR VISION—wind shields, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- THE COX REFLECTORSCOPE—dashboard mirrors, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- CRADLE—auto luggage carriers, Motor Car Supply Co., 1451-55 Michigan Ave., Chicago, Ill.
- CRAFT—steam vulcanizers & tire moulds, Craft Combination Steam Vulcanizer Co., 304 E. 48th St., Minneapolis, Minn.
- CRAIG—portable auto houses, The David Craig Co., 68-70 Broad St., Boston, Mass.
- CRAMP'S—manganese bronze, Akron Brass & Bronze Foundry Co., 10 W. Buchtel Ave., Akron, Ohio.
- CRANDALL—gaskets, leather belting & lace leather, Crandall Packing Co., Palmyra, N. Y.
- CRANE—fly wheel puller, The Crane Puller Co., 15 Harvard Ave., Allston, Mass.
- CRANE—oils, L. M. Crane & Co., 91 Oliver St., Boston, Mass.
- CRANSKA—top & upholstery thread, Cranska Thread Co., Worcester, Mass.
- \*CRAVEN—folding hair brushes, E. Sternfels, Room 507, Flatiron Bldg., N. Y. City.
- CRAWFORD'S SPECIAL—oil, Wm. J. Crawford Co., 14 Wood St., Pittsburg, Pa.
- CREAM LIQUID—metal polish, A. J. Mooney, 359-63 Ninth Ave., N. Y. City.
- CRESCENT—belt fasteners & rivets, Crescent Belt Fastener Co., 143 E. 23rd St., N. Y. City.
- CRESCENT—bicycles, The Pope Mfg. Co., Hartford, Conn.
- CRESCENT—insulation, Crescent Burner Mfg. Co., 339 Broadway, N. Y. City.
- CRESCENT—lamp guards, Crescent Co., Valparaiso, Ind.
- \*CRESCENT—removable rims, The Crescent Parts Co., 244 W. 49th St., New York City, N. Y.
- CRESCENT AMERICA—burner tips, Crescent Burner Mfg. Co., 339 Broadway, N. Y. City.
- CRESCENT BYKE—motorcycles lamp burners, Crescent Burner Mfg. Co., 339 Broadway, N. Y. City, N. Y.
- CRESCENT STALIT—burners, Crescent Burner Mfg. Co., 339 Broadway, New York City.
- CRESCENT TIPTOPTIP—burner tips, Crescent Burner Mfg. Co., 339 Broadway, N. Y. City, N. Y.
- CRESCENT VICTORY—burners, Crescent Burner Mfg. Co., 339 Broadway, N. Y. City, N. Y.
- CRESCENT—wood working machinery & tools, The Crescent Machine Co., Leetonia, Ohio.
- CRESCENT—wrenches, Crescent Tool Co., Jamestown, N. Y.
- CRITERION—ball bearing cones, Stevens & Co., 375 Broadway, N. Y. City.
- CRONE—valve grinding tools, priming pumps & spare wheels, F. G. Crone, 49 E. Utica St., Buffalo, N. Y.
- CRONK—chisels, wrenches, screw drivers & pliers, Cronk & Carrier Mfg. Co., Elmira, N. Y.
- CROUSE-HINDS—timers & distributors, Crouse-Hinds Co., 303 W. Jefferson St., Syracuse, N. Y.
- CROWELL—power pumps, pressure blowers & air compressors, J. G. Crowell, 296-298 Taaffe Pl., Brooklyn, N. Y.
- CROWN—bicycles, Great Western Mfg. Co., La Porte, Ind.
- CROWN—copper rivets, Bridgeport Brass Co., Cor. Fairfield & Holland Aves, N. Y. City.
- CROWN—drills, sand rammers, hammers & pneumatic tools, Ingersoll-Rand Co., 11 Broadway, N. Y. City.
- CROWN—emery wheel dressers, tool grinders, emery wheels, countershafts & polishing & buffing machines, Clizbe Bros. Mfg. Co., Plymouth, Ind.
- CROWN—gasoline marine motors, Yacht Gas Engine & Launch Co., Phila., Pa.
- CROWN—gasoline marine motors, Tessmer Machine & Tool Co., 285-287 Rivard St., Detroit, Mich.

CROWN—hack saw frames, Union Mfg. Co., Torrington, Conn.  
 CROWN—metal polish, Rex Chemical Co., 104 S. Howard St., Baltimore, Md.  
 CROWN—oil, Great Western Oil Co., 2855 E. 37th St., Cleveland, O.  
 CROWN—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.  
 CROWN—oil soap & metal polishes, Crown Soap Co., 1941-43 W. Fayette St., Syracuse, N. Y.  
 CROWN—steel castings, Whiteley Steel Co., Muncie, Ind.  
 CROWN—tire bands, National Leather Belting Co., 29 Ferry St., N. Y. City.  
 CULLMAN—sprockets & differential gears, Cullman Wheel Co., 1310 Greenwood Terrace, Chicago, Ill.  
 CUMMER'S—engine, The James W. Cummer Co., 2900 E. 34th St., Cleveland, Ohio.  
 CURO SAN—hand soap, Standard Leather Washer Mfg. Co., 21-26 Boudinot St., Newark, N. J.  
 CURRY'S—motor boat oils, Curry Oil & Supply Co., Boston, Mass.  
 \*CURTIS—buffer, Curtis Auto-Buffer Co., Olean, N. Y.  
 CURTIS—patent nipple holders, Curtis & Curtis Co., Bridgeport, Conn.  
 CUSHMAN—gasoline marine motors, Cushman Motor Works, 2020-2030 N St., Lincoln, Neb.  
 CUYAHOCA—vehicle & ignition storage batteries, Cleveland Electric Vehicle Co., 1206-1212 Huron Road, Cleveland, O.  
 CYLINDER-TURRET—drill presses, National Separator & Machine Co., Boston, Mass.

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D—colors, roughstuff, primers & fillers, Ditzler Color Co., 18-24 Baltimore Ave., W., Detroit, Mich.  
 D. A. G.—gasoline filters, fire extinguishers, & oil cans, The Denver Auto Goods Co., Denver, Colo.  
 D. D.—current rectifiers, Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo.  
 D. R. BARTON—chisels & planes, Mack & Co., Rochester, N. Y.  
 DWF—automobile ball bearings, Hess-Bright Mfg. Co., 2102 Fairmount Ave., Phila., Pa.  
 D-X—timers, The Duplex Coil Co., Fond du Lac, Wis.  
 DAINTY—auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.  
 \*DALLAN—boat propellers, Dean-Allen Mfg. Co., South Portland, Me.  
 DAMASCUS—steels, Damascus Nickel Steel Co., Carnegie, Pa.  
 DANDY—spark plug protectors, Dandy Mfg. Co., 30 Church St., N. Y. City.  
 DANIC—sand blast machines, D. M. Nichols Iron Works, 2-4 Gouverneur Slip, N. Y. City.  
 DARK LIGHT—gauge lights, cigar lighters, lamp adapters, auto lighting fixtures, Benj. Gerdelman Mfg. Co., 4630 Olive St., St. Louis, Mo.  
 DARMAC—timers, Threadeasy Needle Co., Minneapolis, Minn.  
 DART—gasoline auto motors & buggy chassis, Dart Mfg. Co., 1422-28 Chase St., Anderson, Ind.  
 DAVENPORT—bench drills & tilting vises, The Blissfield Motor Works, Blissfield, Mich.  
 DAVIS—auto brakes, National Aluminum & Bronze Co., Indianapolis, Ind.  
 DAVIS—drill presses & machinery parts, The Hinckley Machine Works, Hinckley, Ill.  
 DAVIS—motors & tabular micrometers, steel storage bins & shelving, Davis Mfg. Co., 267 6th St., Milwaukee, Wis.  
 DAVIS—robes, steel tire protectors, anti-skid devices & Arctic over-pants, Davis Robe Co., Inc., 126 S. State St., Chicago, Ill.  
 DAVIS—slotters, Davis Sewing Machine Co., Dayton, Ohio.

DAVIS—stationary gas engines, Huron Steel & Iron Co., Norwalk, Ohio.  
 DAVIS—steering ball sockets, Greenhalgh Engine & Machine Works, 550 & 552 Central Ave., Newark, N. J.  
 DAYTON—airless tires, Dayton Rubber Mfg. Co., 1206 Kaiser St., Dayton, Ohio.  
 DAYTON—gasoline storage outfits, The Dayton Iron Works Co., Dayton, O.  
 DAYTON—grinders, internal, surface, tool & universal, Miami Valley Machine Tool Co., Dayton, O.  
 DAYTON—pneumatic tools, Dayton Pneumatic Tool Co., Dayton, Ohio.  
 DAYTON—power hammers, The Foglesong Machine Co., 127 Ringgold St., Dayton, Ohio.  
 DAYTON—switches & boat lighting outfits, The Dayton Electrical Mfg. Co., 89 St. Clair St., Dayton, Ohio.  
 DAYTON—tire protectors, Dayton Inner Tire & Mfg. Co., 17 Madison St., Dayton, Ohio.  
 DEAN—stationary gas engines, Dean Mfg. Co., South Cincinnati, Newport, Ky.  
 \*DEAN'S EUREKA—automobile bearings (babbitt), Dean-Allen Mfg. Co., South Portland, Me.  
 DECALCIFIER—boiler & radiator compounds, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.  
 DECARBONIZER—carbon removers, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.  
 DE CARBONIZER—carbon removers, La France De Carbonizer Co., 522 Cleveland Ave., Chicago, Ill.  
 DE DION—magnetos, imported by The Motor Car Equipment Co., 55 Warren St., N. Y. City, N. Y.  
 DEDION-BOUTON—marine engines, imported by De Dion-Bouton Selling Branch, 1649 Broadway, N. Y. City.  
 \*DEFENDER—tire covers, Beebe-Elliott Co., Racine, Wis.  
 DEFIANCE—bicycle tires, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.  
 DEFIANCE—gasoline & oil storage barrels & air fuel & water tanks, Defiance Steel Package Co., Defiance, Ohio.  
 DEFIANCE—machinery, The Defiance Machine Works, Defiance, Ohio.  
 DEFIANCE—auto wheels, The Turnbull Waggon Co., Defiance, O.  
 DEFREEST—propeller wheels, Jerome E. De Freest, 256 Third Ave., North Troy, N. Y.  
 DELAUNAY-BELLEVILLE—chassis, imported by Brewster & Co., Broadway & 47th St., N. Y. City.  
 DELAWARE—tail lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.  
 DELCO—ignition systems, The Dayton Engineering Laboratories Co., Dayton, Ohio.  
 DELPEUCH—tire inflators & air compressors, Nightingale Whistie Mfg. Co., 1777 Broadway, N. Y. City.  
 DELPHOS—oil cans, The Delphos Mfg. Co., Delphos, O.  
 DELTA—files & rasps, Carver File Co., Phila., Pa.  
 DELTA—plugs, batteries & battery & coil cases, Delta Mfg. Co., Bloomfield, N. J.  
 DELTA METAL—castings, The Phosphor Bronze Smelting Co., 2200 Washington Ave., Phila., Pa.  
 DELUXE—acetylene auto lamp burners, American Lava Co., Chattanooga, Tenn.  
 DE LUXE—overhead vehicle washer, John W. Frey, 722 Main St., Buffalo, N. Y.  
 DELUXE—timers, The Altemus Mfg. Co., 42nd & Chestnut Sts., Phila., Pa.  
 DEMO—tire pumps, Bridgeport Brass Co., Cor. Fairfield & Holland Aves., N. Y. City.  
 DENEGRE—demountable rims, Denegre Demountable Rim Co., 522 S. 20th St., Birmingham, Ala.  
 DERAIN—automobile motors & generator sets, The Derain Motor Co., 7500 Quincy Ave., Cleveland, Ohio.  
 DERBY—automobile tires, Thermold Rubber Co., Trenton, N. J.

- DERBY—taps & dies, Butterfield & Co., Derby Line, Vt.
- DERRER—lathe attachment for turning odd shapes, Lancaster Machine & Knife Works, Lancaster, N. Y.
- DE TAMBLE—gasoline automobile engines, De Tamble Motors Co., Anderson, Ind.
- DETROIT—metal auto bodies, stationary & marine gasoline & kerosene engines, The Michigan Steel Boat Co., 1250-1500 Jefferson Ave., Detroit, Mich.
- DETROIT FENESTRA—window sashes, Detroit Steel Products Co., 91-99 E. Fort St., Detroit, Mich.
- DETROIT—grinders, Detroit Emery Wheel Co., Detroit, Mich.
- DETROIT—lubricators & grease cups, Detroit Lubricator Co., Detroit, Mich.
- \*DETROIT—marine gasoline engines, Detroit Engine Works, 1263 Jefferson Ave., Detroit, Mich.
- DETROIT—radiators & gaskets, Detroit Radiator Co., 324 Jefferson Ave., W., Detroit, Mich.
- DETROIT—shock absorbers, Geo. W. Bolton, 260 Wreford Ave., Detroit, Mich.
- DETROIT—steering wheels, Detroit Steering wheel & Wind Shield Co., 274-288 Wight St., Detroit, Mich.
- DEXTER—scroll saws, Trump Bros. Machine Co., Wilmington, Del.
- DIABLO—spark plugs, Mica Core Mfg. Co., 442 E. 116th St., N. Y. City.
- DIAMO—ignition batteries, dry, Universal Carbon Co., Ashland, Mass.
- DIAMO-CARBO—emery wheel dressers, Desmond-Stephan Mfg. Co., Urbana, Ohio.
- DIAMOND—acetylene auto & motorcycle lamps, gas generators, swivel lamp brackets & elec. auto lamps, Chicago Auto Lamp Works, 71-75 W. Jackson Blvd., Chicago, Ill.
- DIAMOND—bicycle wrenches, Frank Mossberg Co., Attleboro, Mass.
- DIAMOND—chain drives, auto chains & cycle chains, name plates, auto wheel hubs & sprockets, Diamond Chain & Mfg. Co., 241 W. Georgia St., Indianapolis, Ind.
- DIAMOND—cutting machines, The Tschudi-McBarron Machine Co., Armory Bldg., Dayton, Ohio.
- DIAMOND—dowel pins, chucks, lathes & foundry flasks, Diamond Clamp & Flask Co., Richmond, Ind.
- DIAMOND—electric traffic signals, Diamond Igniter Co., 2231 Broadway, N. Y. City.
- DIAMOND—grinders, lathes & polishing & buffing machines, Diamond Machine Co., Providence, R. I.
- DIAMOND—hardening compound, W. F. Altemus, 526 Prospect Ave., Hartford, Conn.
- DIAMOND—ignition batteries, dry, Union Battery Co., Belleville, N. J.
- DIAMOND—insulation, (porcelain), Diamond Porcelain Co., Chauncey St., Trenton, N. J.
- DIAMOND—metal polish, Foskett & Co., 226-28 La Salle St., Chicago, Ill.
- DIAMOND—spark plugs, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Illinois.
- DIAMOND—sparkling coils, spark plugs, ignition batteries & taximeters, Westchester Appliance Co., 1315 Canal Place, Bronx Boro., N. Y.
- DIAMOND—tires, rims, tire repair tools, inner tubes, staybolts, igniter cable bar, battery jars, bumpers, mats & matting, steering wheel rims, tire plugs & patches, auto parts, tube protectors, tire valves, gas bags, cements, etc., Diamond Rubber Co., Akron, O.
- \*DIAMOND—turret head, Chas. T. Luce Co., 160 Congress St., Boston, Mass.
- DIAMOND—welding compound, Cortland Welding Compound Co., Cortland, N. Y.
- DIAMOND M—tire tools, pedals, ammeters & voltmeters, Chas. E. Miller, 97-101 Reade St., N. Y. City.
- DIAMOND PULVS—valve grinding compounds, Diamond Pulvs Co., 1331 Intervale Ave., N. Y. City.
- DIE-CAST—metal figures & letters, Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, Ohio.
- DIETER—steam auto & marine motors, The Dieter Steam Engine Co., 123 Liberty St., N. Y. City, N. Y.
- DILL—variable speed drive, T. C. Dill Machine Co., Inc., Somerset, Mascher & Mutter Sts., Phila., Pa.
- \*DIAMOND—rear signals, Diamond Igniter Co., 2231 Broadway, N. Y. City.
- DISSTON—saws, metal hand, Henry Disston & Sons, Inc., Tacony, Phila., Pa.
- DIVER—leather belting, Jewell Belting Co., 53 Trumbull St., Hartford, Conn.
- DIV. PLUGS—split nuts, The Standard Metalwork Co., Thompsonville, Conn.
- DIXIE—ignition batteries, Chicago Battery Co., 2600-10 Wabash Ave., Chicago, Ill.
- DIXIE—stitched cotton & duck belting, The Gandy Belting Co., 728-40 West Pratt St., Baltimore, Md.
- DIXIE—wind shields, Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill.
- DIX LIFE OF LEATHER—top dressing, Dix Mfg. Co., Lewistown, Pa.
- DIXON'S—pipe joint compound, motor graphite, cup grease, motor chain compound & transmission lubricants, Jos. Dixon Crucible Co., Jersey City, N. J.
- DOBSON—hand bellows & moulders' tools, Wm. Dobson, Canastota, N. Y.
- DODGE—bearing metals, friction clutches, pulleys, shafting & hangers, Dodge Mfg. Co., Mishawaka, Ind.
- \*DODGE—mechanical tire inflators, Frank Dodge, 420 Boylston St., Boston, Mass.
- DOEHLER—die castings, bearings, composition castings & oil cups, Doehler Die-Casting Co., 187 W. 9th St., Brooklyn, N. Y.
- DOLLAR—spark plugs, tire tools & valve lifting tools, J. Stewart Smith, 1779 Broadway, N. Y. City.
- DOPP—Cutting compound mixers, H. W. Dopp Co., Buffalo, N. Y.
- DORAIN—removable rims, The Burroughs Removable Rim Co., 225 W. 57th St., N. Y. City.
- DORLAND—time switches, Leslie C. Dorland, Poughkeepsie, N. Y.
- DORMAN—tapping attachments, John H. Dorman, Bethune St., N. Y. City.
- DOUBLE LOCK—tire patches, J. Stewart Smith, 1779 Broadway, N. Y. City (Mfg.'s agent).
- DOVER—oil cans, Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
- DOWNING—grease guns, tire holders, antiskid chains, robe rails, foot rails & pedals, lamp brackets, eagles & animals for radiators, Charles J. Downing, 1777 Broadway, N. Y. City.
- DOW—inner tubes, Dow Tire Co., 2000 Broadway, N. Y. City.
- DOW—removable rims, Dow Rim Co., 1783 Broadway, N. Y. City.
- DOW—spark plugs, sparking coils, switches, timers, ammeters, voltmeters, volt-ammeters & magnetos, The Dow Mfg. Co., Braintree, Mass.
- DRAGON—axles & springs, Sheldon Axle Co., Wilkes-Barre, Pa.
- DRAGON—cement concrete for garages, Lawrence Portland Cement Co., Broadway, N. Y. City.
- DRAKE—acetylene self-cleaning lamp burners, Drake Acetylene Burner Co., San Jose, Cal.
- DRAKE—oil, Oil City Oil & Grease Co., Oil City, Pa.
- DRAPER—robes, Draper Bros. Co., Canton, Mass.
- DREADNAUGHT—bicycles & tires, New York Sporting Goods Co., 17 Warren St., N. Y. City, N. Y.
- DREDGER—marine engines, Loane-Hiltz Engineering Co., 320 S. Hanover St., Baltimore, Md.
- DRIVER—belt sanders, C. H. Driver, 1320 16th St., Racine, Wis.

DRUCKLIEB—sand blast tumbling barrels, C. Drucklieb, 132 Reade St., N. Y. City.

DUBUQUE—keyseaters, Novelty Iron Works, Dubuque, Iowa.

DUCK—roller brake, New York Sporting Goods Co., 17 Warren St., New York City.

DUCK—tandem attachments, spring frames & belts, motorcycle, A. W. Duck, 427 15th St., Oakland, Cal.

DUCKWORTH—cycle chains, Duckworth Chain & Mfg. Co., 41 Mill St., Springfield, Mass.

DUDLY—wrenches, Menominee Electric Mfg. Co., Menominee, Mich.

DULL KOTE PAINT—motor boat paint, Johnston Paint Co., 226 Main St., Cincinnati, O.

DULL TONE ENAMEL—yacht enamel, Johnston Paint Co., 226 Main St., Cincinnati, O.

DUNCAN—magnetos, D. K. Electric Co., 211-213 Chestnut St., St. Louis, Mo.

DUNLOP—auto tires, Hartford Rubber Works Co., 691 Park St., Hartford, Conn.

\*DUNN—gasoline marine motors, Walter E. Dunn, 12 W. River St., Ogdensburg, N. Y.

DUNN SEMI-DRY—ignition batteries, The Semi-Dry Battery Co., 5th & Essex Sts., Harrison, N. J.

DUPELX—auto brakes, The Royal Equipment Co., 414-32 Housatonic Ave., Bridgeport, Conn.

\*DUPELX—carburetors, clamps, cleats, tackle blocks, steering wheels, roller bearings & boat propellers, Duplex Roller Bushing Co., Belfast, Me.

DUPELX—collapsible buckets & basins, folding funnels & trunks, The Planet Co., Westfield, Mass.

DUPELX—electric horn attachments, Electric Auto Horn Co., Pittsburg, Pa.

DUPLEX—gas bicycle lamps, Miller Manufacturing Co., 813 Central Ave., Peekskill, N. Y.

DUPLEX—gasoline motor boats, The Duplex Roller Bushing Co., Belfast, Me.

DUPELX—horns, electric, auto, The Electric Auto Horn Co., 6112 Station St., Pittsburg, Pa.

DUPELX—pipe cutting & threading machines, Bignall & Keeler Mfg. Co., Edwardsville, Ill.

DUPLEX—pipe threading & bolt threading tools & screw plates, The Hart Mfg. Co., 1362 E. 3rd St., N. E., Cleveland, O.

DUPLEX—power hack saws, Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.

DUPLEX—spark coils & switches, Duplex Coil Co., Fond du Lac, Wis.

DUPELX—tire holders, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.

DUPLEX—wind shields, glass, Columbus Auto Part & Machine Co., 4th & E. Goodall Sts., Columbus, O.

DUPLEX—wire terminals, Bliss-Chester Co., 31 Mathewson St., Providence, R. I.

DUPLEX-EXIDE—ignition batteries, Electric Storage Battery Co., 19th St., & Allegheny Ave., Phila., Pa.

DUPLEX-LOHI—magnetos, The Duplex Coil Co., Fond du Lac, Wis.

DURA—varnish, Hotopp Varnish Co., First & Marshall Sts., Hoboken, N. J.

DURAND—steel lockers & tables, Durand-Steel Locker Co., 1244 American Trust Bldg., Chicago, Ill.

DURAX—water gauge glasses, Schaeffer & Budenberg Mfg. Co., 963-5 Kent Ave., Brooklyn, N. Y.

DURO—babbitt bearing metal, Mogul Metal Co., 149-151 Larned St., Detroit, Mich.

DURO—ignition batteries, electric auto & boat lamps, dome lights & switches, Chicago Battery Co., 2600-10 Wabash Ave., Chicago, Ill.

DURYAOYL—oils, Chas. E. Duryea, Reading, Pa.

DURYEA—auto motors, chains & marine motors, Chas. E. Duryea, Reading, Pa.

DUSTLESS CHAIN DRESSING—grease, Cleveland Auto-Clutch Dressing Co., Cleveland, Ohio.

DUTCH—cement, tire, Van Cleef Bros., 7711 Woodlawn Ave., Chicago, Ill.

DUTCH BOY PAINTER—white lead for painting, National Lead Co., 111 Broadway, N. Y. City.

DUTCHESS—auto heaters, Chicago Flexible Shaft Co., Chicago, Ill.

DUTCH OIL—auto body soap, White Star Refining Co., 307 White Bldg., Buffalo, N. Y.

DYKE'S—publications & correspondence course, A. L. Dyke, 3947 Washington Ave., St. Louis, Mo.

DYNATAK—dynamometers, speed indicators & odometers, The Electric Speedometer & Dynamometer Mfg. Co., 1317-19 New York Ave., N. W., Washington, N. D.

## E

E. & J.—acetylene electric lamps for autos, oil lamps, gas generators, boat lamps, acetylene, oil & electric, Edmunds & Jones Mfg. Co., 313-315 Riopelle St., Detroit, Mich.

E & M TABOR—wind shields, The English & Mersick Co., 122-26 Winchester Ave., New Haven, Conn.

E. T. W.—hammers, punches, fullers & swages, Evansville Tool Works, Evansville, Ind.

E-Z—boat seats, Irwin Mfg. Co., Galesburg, Ill.

E-Z—tire inflators, Wheaton & Utley, Sunbury, Ohio.

E-Z—valve grinding compounds—J. F. Bornschein & Co., 2351 Indiana Ave., Chicago, Ill.

E-Z-BLOW—motor boat horns, American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City.

E-Z-2-C—fuel level indicators, auto & marine, National Motor Supply Co., Cleveland, O.

EAGLE—cleansing compounds, auto body, Eagle Lubricating Oil Co., 426-28 First Ave., Pittsburg, Pa.

EAGLE—cycle motors, Eagle Motor Works, 1111 E. Franklin Ave., Minneapolis, Minn.

EAGLE—files & misc. tools, The Whitaker Mfg. Co., 599 W. Monroe St., Chicago, Ill.

EAGLE—files & rasps, Nicholson File Co., Providence, R. I.

EAGLE—gasoline marine engines, The Progressive Mfg. Co., Torrington, Conn.

EAGLE—hack saw frames, Union Hardware Co., Torrington, Conn.

EAGLE—hardware, auto, The Walter W. Woodruff & Sons Co., Mt. Carmel, Conn.

EAGLE—ignition storage batteries, The Eagle Storage Battery Co., 269 W. 17th St., N. Y. City.

EAGLE—lubricators, steel, Eagle Glass & Mfg. Co., Wellsburg, W. Va.

EAGLE—marine gasoline engines, The Eagle Co., 98 Warren St., Newark, N. J.

EAGLE—nuts, bolts & webbing, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.

EAGLE—springs, Miller & Van Winkle, 18-24 Bridge St., Brooklyn, N. Y.

EAGLE—threading tools, taps & dies, wrenches & diestocks, American Tap & Die Co., Greenfield, Mass.

EAGLEINE—oils & greases, Eagle Oil & Supply Co., 104 Broad St., Boston, Mass.

EAMES—socket & spark plug wrenches, Eames Tool Co., Inc., Lynn, Mass.

EARL—wind shields, Earl Automatic Wind Shield Co., 2335 Wabash Ave., Chicago, Ill.

EASTERN—gasoline & oil pumps, for garage use, gasoline & oil storage outfits, Eastern Oil Tank Co., 146 Fletcher St., Lowell, Mass.

EASTERN—ignition batteries, dry, National Carbon Co., Lock Drawer L. Cleveland, O.

EASY—bolt clippers, H. K. Porter, 6 Ashland St., Everett, Mass.

EASY—taps & dies, Champion Blower & Forge Co., Lancaster, Pa.

EASYBRIGHT—metal polish, B. F. Stinson Co., 424 Niagara St., Buffalo, N. Y.

- EBERHARD—aluminum solder, C. F. Eberhard, 25 Helen St., Buffalo, N. Y.
- EBERMAN—tire inflators, Eberman Auto Appliance Co., 1205 Monadnock Bldg., Chicago, Ill.
- EBONITE—packing, Quaker City Rubber Co., 629 Market St., Phila., Pa.
- EBONY—core compound, The Hill & Griffith Co., 1248-1262 State Ave., Cincinnati, Ohio.
- ECHO—horns & muffler cut-outs, Echo Horn Co., 5601 Carnegie Ave., Cleveland, O.
- ECK—dynamos & electric motors for machinery, Eck Dynamo & Motor Co., Belleville, N. J.
- ECLAT—wood polish & auto body cleansing compounds, Eclat Mfg. Co., 3425 State St., Chicago, Ill.
- ECLIPSE—acetylene gas tanks, The Marion Acetylene Specialty Co., 162 Broadway, Marion, N. J.
- ECLIPSE—ammeters, Eldredge Elec. Mfg. Co., 3 Post Office Square, Springfield, Mass.
- \*ECLIPSE—auto oil, Flint Oil Co., Providence, R. I.
- ECLIPSE—bicycle & motorcycle hubs, head fittings, power hack saws, coaster brakes, 2 speed gears & cranks, Eclipse Machine Co., Elmira, N. Y.
- ECLIPSE—breast drills, Lancaster Machine & Knife Works, Lancaster, N. Y.
- ECLIPSE—carburetors (Marine), Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y.
- ECLIPSE—chain guards, auto, John Bohnet & Co., 114-116 Grand Ave., S., Lansing, Mich.
- ECLIPSE—fire extinguishers, Haverhill Fire Appliance Co., 40 Merrimac St., Haverhill, Mass.
- \*ECLIPSE—gasoline marine motors, Eclipse Motor Co., Mancelona, Mich.
- ECLIPSE—gasoline marine motors, Harms Bros., 900-902 S. Ann St., Baltimore, Md.
- ECLIPSE—oil filters, Industrial Instrument Co., Foxboro, Mass.
- ECLIPSE—window anti-rattlers, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- ECONOMIC—piston ring expanders, Economic Tool Co., Lorain, O.
- ECONOMIZER—stationary engines, Chapman Engine Works, Marcellus, Mich.
- ECONOMY—bicycles, Economy Cycle Supply Co., Detroit, Mich.
- ECONOMY—charging apparatus for ignition batteries, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.
- ECONOMY—emery grinders, William S. Nicholls, 253 Broadway, N. Y. City.
- ECONOMY—portable houses, Nicola Building Co., Farmers' Bank Bldg., Pittsburg, Pa.
- ECONOMY—roughstuff & primers, The Cawn Mining & Mfg. Co., Canton, O.
- \*ECONOMY—spark plugs, Economy Mfg. Co., 199 Grand St., N. Y. City.
- ECONOMY—stationary gasoline engines, Holm's Machine Mfg. Co., Sparta, Mich.
- ECONOMY—stocks & dies, F. E. Wells & Son Co., Greenfield, Mass.
- ECONOMY—switches, Seidler-Miner Supply Co., 207-211 Jefferson Ave., Detroit, Mich.
- ECONOMY—tool box locks, The International Mfg. Co., 202 Marine Bank Bldg., Baltimore, Md.
- \*ECONOMY—wind shields, Auto Economy Co., 1426 Michigan Ave., Chicago, Ill.
- EDCO—tire lugs & valves, spark plugs, rivets & chrome leather for anti-skid tires, imported by Ch. Dien, 45 W. 34th St., N. Y. City.
- EDCO—spark plugs, tire lugs, tire valves & locknuts, imported by S. Breakstone, 1712 Michigan Ave., Chicago, Ill.
- EDELMANN—tire gauges, E. Edelmann & Co., 36 La Salle St., Chicago, Ill.
- EDGEMONT—friction clutch pulleys, cut-off couplings & sleeve clutches, The Edgemont Machine Co., Dayton, Ohio.
- EDISON—Ignition & vehicle batteries, Edison Storage Battery Co., Orange, N. J.
- \*EDISON—spark plugs, road maps & holders, Edison Auto Accessories Co., Pleasantdale, N. J.
- EDW. REUKAUF—curtain rollers, Carey & Co., 241-45 Arch St., Phila., Pa.
- EGYPTIAN—metal cement, S. H. Brand Co., Chicago, Ill.
- EISEMANN—magnetos, The Eisemann Magneto Co., 225-227 W. 57th St., N. Y. City.
- EISNER—sparkling coils, distributors, switches & timers, Harry Eisner & Co., 29 Scotia St., Boston, Mass.
- EJECTOR—exhaust mufflers for auto engines, The Motor & Mfg. Works Co., Foot of Middle St., Geneva, N. Y.
- EL ARCO—radiators, El Arco Radiator Co., 6 E. 31st St., N. Y. City.
- ELB—ignition batteries, Willard Storage Battery Co., Marquette Road & Lakeside, Cleveland, Ohio.
- ELBA—electric auto lamps & lightning dynamos, Willard Storage Battery Co., Marquette Road & Lakeside, Cleveland, O.
- ELBRIDGE—dynamos & electric dynamos & switches, Elbridge Electrical Mfg. Co., Elbridge, N. Y.
- ELBRIDGE—marine gasoline engines & boat lighting outfits, Elbridge Engine Co., Culver Road, Rochester, N. Y.
- ELCO—electric, gasoline & steam motor boats, The Electric Launch Co., 179 Avenue A, Bayonne, N. J.
- ELDER—pneumatic punctureless tires & elevator safety gates, Elder Mfg. Co., Indianapolis, Ind.
- ELECTRIC—metal polish, J. Wesley Edmonds & Son, 214 Franklin St., N. Y. City.
- ELECTRIC—rubber hose & belting, United & Globe Rubber Mfg. Co., Trenton, N. J.
- ELECTRIC—taps & dies, Champion Blower & Forge Co., Lancaster, Pa.
- ELECTROSE—insulation, Electro Mfg. Co., 127 N. 10th St., Brooklyn, N. Y.
- ELECTRO-CORNO—electric auto & boat horns, Elkhart Dry Battery & Signal Co., 117 Commercial St., Elkhart, Ind.
- \*ELECTROSHINE—metal polish, The Brighton Chemical Co., 1220 George St., Chicago, Ill.
- ELEPHANT BRAND PHOSPHOR BRONZE—castings, ingots, wire, rods, sheets, etc., The Phosphor Bronze Smelting Co., 2200 Washington Ave., Phila. Pa.
- ELGIN—electric auto lamps, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- ELI—circulation pumps, Moline Pump Co., Moline, Ill.
- ELITE—ammeters, Manhattan Electrical Supply Co., 17 Park Pl., New York, N. Y.
- EIK—bicycle tires (jobbers), New York Sporting Goods Co., 17 Warren St., New York City.
- ELK—tire bands, National Leather Belting Co., 29 Ferry St., N. Y. City.
- ELLAITCHEE—carburetor floats & brake lining, The Jayaitcheff Co., Baltimore, Md.
- ELLINGWOOD—chucking machines & tenoners, Niagara Machine Co., 825-27 Linwood Ave., Niagara Falls, N. Y.
- ELLIOTT—acetylene gas storage generator, Eco Mfg. Co., 53 State St., Boston, Mass.
- ELLIOTT—acetylene lamp lighters, Chas. Elliott & Co., 422 N. Charles St., Baltimore, Md.
- ELLIOTT PAT.—acetylene gas generators, F. Cortez Watson & Co., 239-241 Lake Street, Chicago, Ill.
- ELLIOTT PROCESS—cross chains, The Cassidy-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- ELLIS SPECIAL—auto oils, E. D. Ellis Oil Co., 213 Jefferson Ave., Detroit, Mich.
- ELM CITY—bolt & rivet clippers, Wm. Schollhorn Co., New Haven, Conn.
- ELM CITY—stump joints, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- ELMENDORF—varnish, Elmendorf Varnish Co., 841-45 Larrabee St., Chicago, Ill.
- ELMIRA—screw drivers, Cronk & Carrier Mfg. Co., Elmira, N. Y.
- ELMORE—by-pass screens, The Kneega Co., Inc., Washington, D. C.



- ELMORE—hand punches, Cronk & Carrier Mfg. Co., Elmira, N. Y.
- ELMORE—screw drivers, pliers, hand punches, chisels, drop forged tools & cotter pin extractors, The Elmore Tool Mfg. Co., Hartford, Conn.
- ELSNER—auto seats, Elsner Auto Seat Co., Racine, Wis.
- ELTA—burners, Wm. M. Crane Co., 1131-1133 Broadway, N. Y. City.
- EMANCIPATOR—tire inflating tanks, Liquid Carbonic Co., 67 Wells St., Chicago, Ill.
- EMBESTOS—brake lining, Empire Tire Co., Trenton, N. J.
- EMCO—dry batteries, Electric Mfg. Co., 355 Minnesota St., St. Paul, Minn.
- \*EMERGENCY—spring repair devices, Emergency Spring Repairer Co., 2128 Broadway, N. Y. City, N. Y.
- EMERY CAKE—buffing & polishing compounds, Frederic B. Stevens, Detroit, Mich.
- EMPIRE—auto & bicycle tires, auto tirecases, tire protectors, tire repair articles, tube cases & bags, inner tubes & tube patches, ignition cable & asbestos packing, Empire Tire Co., Trenton, N. J.
- EMPIRE—habbitt, Empire Metal Co., Syracuse, N. Y.
- EMPIRE—bows, Empire Bending Works, Lancaster, Pa.
- EMPIRE—drill ratchets, Syracuse Wrench Co., Franklin & Water Sts., Syracuse, N. Y.
- \*EMPIRE—gasoline marine engines, Empire Cream Separator Co., Fischer Bldg., Chicago, Ill.
- EMPIRE—hairpickers, G. H. Lounsbury & Sons, 107-109 W. Third St., Cincinnati, O.
- EMPIRE—jacks, The Empire Jack Co., 11-15 Dill St., Auburn, N. Y.
- EMPIRE—lamps, auto & boat, Indiana Lamp Co., Connerville, Ind.
- EMPIRE—miniature candelabra lamps & sockets, H. W. McCandless & Co., 67-69 Park Place, N. Y. City.
- EMPIRE—packing, Canfield Mfg. Co., Lehigh Ave. & Howard St., Phila., Pa.
- EMPIRE—Removable rims, Empire Tire Co., Trenton, N. J.
- EMPIRE—storage batteries, Empire Battery Co., Inc., 1876 Broadway, N. Y. City.
- EMPIRE—spark plugs, Grant Mfg. Co., 90 Silliman Ave., Bridgeport, Conn.
- \*EMPIRE—tops, wind shields, folding seats & bow separators, Empire Auto Top Co., 207 N. 22nd St., Phila., Pa.
- \*EMPIRE—vulcanizers & fuel level indicators, The Empire Auto Specialty Mfg. Co., Berea, O.
- EMPIRE—wrenches, William Hjorth & Co., Jamestown, N. Y.
- EMPRESS—oil & grease cups & oil hole covers, Bowen Mfg. Co., Mechanic St., Auburn, N. Y.
- ENAMELAC—top dressing, Enamelac Varnish Co., Racine, Wis.
- ENERGINE—gasoline & naphtha, The Energine Refining & Mfg. Co., 809 Cuyahoga Bldg., Cleveland, O.
- THE ENGINEER POMADE—metal polish, Cleaner Mfg. Co., 2842 Olive St., St. Louis, Mo.
- ENGLAND—carburetors, Arthur England Co., Merrimac, Mass.
- ENGLEBERT—tire, imported by Louis G. Duquet, 107 W. 36th St., N. Y. City.
- ENNIS—tires & tubes, Ennis Rubber Mfg. Co., 22 Commercial St., Newark, N. J.
- ERICKA AUTO-CAR—auto body soap, The Ericka Mfg. Co., 872-882 Liberty St., Springfield, Mass.
- ERICKA—hand soap, Ericka Mfg. Co., Inc., 872-882 Liberty St., Springfield, Mass.
- ERICKSON—gasoline mixers, auto snow shoes & taxicab "for hire" signs, Raimes & Co., 50 Ferry St., N. Y. City.
- ERIE—cycle motors & motorcycle accessories, Motorcycle Equipment Co., Hammondsport, N. Y.
- ERIE—grease & oil cups, oil reservoirs & special metal stamping of all kinds, Erie Stamping & Mfg. Co., Erie, Pa.
- ERIE—hammers (steam & drop), Erie Foundry Co., Erie, Pa.
- \*ERIE—stationary engines & gasoline marine engines, Erie Pump & Engine Co., Erie, Pa.
- ERNST—combined turntable & wash rack, C. F. Ernst's Sons, 65 Lathrop St., Buffalo, N. Y.
- ERRINGTON—tapping chucks, die heads & stud or nut setters, E. A. Errington, 39 Cortlandt St., N. Y. City.
- ESCO—ball bearing cups, automobile horns, tire pumps & wrenches, Stevens & Co., 375 Broadway, N. Y. City.
- ESCO—wrenches, pressed steel nut covers, Erie Stamping & Mfg. Co., Erie, Pa.
- ESSEX—carburetors & top supports, Essex Brass Foundry Co., 141-45 Main St., Cambridge, Mass.
- ESSEX—gasoline marine motors, The Essex Engine Co., 416 Union St., Lynn, Mass.
- \*ESSEX—lock washers, Essex Mfg. & Supply Co., Newark, N. J.
- ESSEX—lubricators, carburetors, grease cups, oil & grease injectors & stuffing boxes, G. B. Essex Brass Co., 480-486 Franklin St., Detroit, Mich.
- EUREKA—automobile tops, The Eureka Co., Rock Falls, Ill.
- EUREKA—enameled goods cutters, G. H. Lounsbury & Sons, 107-109 W. Third St., Cincinnati, O.
- EUREKA—foundry flasks, Smith & Caffrey Co., Syracuse, N. Y.
- EUREKA—gasoline gauges, Stecker Electric & Machine Co., Detroit, Mich.
- EUREKA—gasoline storage outfits, National Oil Pump & Tank Co., 411-413 E. First St., Dayton, Ohio.
- EUREKA—grease & transmission compounds, L. M. Crane & Co., 91 Oliver St., Boston, Mass.
- EUREKA—lock nuts, Eureka Nut Lock Co., 32nd & Smallman Sts., & A. V. R. R., Pittsburg, Pa.
- EUREKA—magnetos, Henricks Novelty Co., 124-128 Capitol Ave., S. Indianapolis, Ind.
- EUREKA—oil (jobbers), Fidelity Oil Co., 600-602 W. 6th St., Kansas City, Mo.
- EUREKA—rapid acting machinists' vises, Emmert Mfg. Co., Waynesboro, Pa.
- \*EUREKA—reversing gears, Eureka Reverse Gear Co., 172 Pearl St., Hartford, Conn.
- EUREKA—self closing nozzles, Geo. Grossel-finger, 192 Front St., N. Y. City.
- EUREKA—soldering flux, Grasselli Chemical Co., Cleveland, Ohio.
- EUREKA—tool grinders & polishing & buffing machines, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.
- EUREKA—valve grinding compound, Auto Equipment Co., 32 Hollywood Ave., East Orange, N. J.
- EUREKA—wax wire core vent, S. H. Brand Co., Chicago, Ill.
- EUREKA TRIPLEX—tire pumps, Judd & Le-land Mfg. Co., Clifton Springs, N. Y.
- EUREKA—wadding, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- EUREKA YANKEE—hack saw blades, Henry G. Thompson & Son Co., New Haven, Conn.
- EVANS—electric vulcanizers, Electric Vul-canizer Co., 618 3rd Ave., S. Minneapolis, Minn.
- EVANS—transmission gears, Merchant & Evans Co., 517 Arch St., Phila., Pa.
- EVER-BRIGHT—rust preventives, Legnard Bros., 203-05 Genesee St., Waukegan, Ill.
- EVERGOOD—belting, Thermoid Rubber Co., Trenton, N. J.
- EVERLASTING—axles, Sheldon Axle Co., Wilkes-Barre, Pa.
- EVER-LASTING LUSTRE—tarnish preven-tatives, The Igniter Appliance Co., 302 Electric Bldg., Cleveland, Ohio.
- EVEREADY—ammeters, cigar lighters, clocks, gauge lamps, ignition batteries, inspection lamps, terminals, vacuum bottles, voltme-ters, voltammeters & miniature carbon & Tungsten lamps, American Ever Ready Co., 304-322 Hudson St., N. Y. City.



- EVER READY—auto engine starter, speed indicator, vulcanizer & taximeters, The Auto Improvement Co., 304 Hudson St., N. Y. City.
- EVEREADY BULLDOG—battery connections, American Ever Ready Co., 304-322 Hudson St., N. Y. City.
- EVER-READY—cross chains, Newhall Chain Forge & Iron Co., 90 West St., N. Y. City.
- EVER READY—vehicle washers, I. J. Smith Mfg. Co., Inc., 4283 Park Ave., N. Y. City.
- EVER RIGHT—tire cements, tire tape & enamels, Keyser Fry, 723-25 Chestnut St., Reading, Pa.
- \*EVER—wrenches, Detroit Wrench Co., 45 State St., Detroit, Mich.
- EXCEL—voltmeters, voltmeters & ammeters, Excel Instrument Co., 1555 E. 65th St., Cleveland, O.
- EXCELSIOR—automobile tops, W. H. Newton & Son, 127 Elm St., Cortland, N. Y.
- EXCELSIOR—bicycle chain lubricant & cylinder oils, Wm. P. Miller's Sons, Nott Ave. & Hancock St., Long Island City, N. Y.
- EXCELSIOR—cushion springs, (auto), Trenton Spring Mattress Co., Trenton, N. J.
- EXCELSIOR—drilling machines, The Tschudi-McBarron Machine Co., Armory Bldg., Dayton, Ohio.
- EXCELSIOR—gasoline automobile engines, Excelsior Motor & Mfg. Co., 2200-39 Union Ave., Chicago, Ill.
- EXCELSIOR—generator valves, Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y.
- EXCELSIOR—grease, E. H. Kellogg & Co., 243 & 244 South St., New York City, N. Y.
- EXCELSIOR—motorcycle tandem attachments, crank hangers, cycle stands & spokes, lamp adapters, luggage carriers & gasoline auto engines, Excelsior Supply Co., 233-37 Randolph St., Chicago, Ill.
- \*EXCELSIOR—punches & shears, Excelsior Tool & Machine Co., E St., St. Louis, Mo.
- EXCELSIOR—revolving overhead vehicle washers, The Vehicle Specialty Co., Inc., 26 State St., Hartford, Conn.
- EXCELSIOR—rubber hose & matting, Boston Belting Co., 256-60 Devonshire St., Boston, Mass.
- EXCELSIOR—soldering fluid, A. Schultz & Co., 1015-19 E. Fayette St., Baltimore, Md.
- EXCELSIOR—steam vulcanizers, Wishart-Burge Machine Works, 58-66 N. Jefferson St., Chicago, Ill.
- EXCELSIOR—window anti-rattlers & curtain fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- EXCELSIOR BRAND CAN'T RIP—tool bags & tire cases, Excelsior Implement Co., Inc., Troy, N. Y.
- EXCENTRIC—mica plugs, The Mica Core Mfg. Co., 442 E. 166th St., N. Y. City.
- EXETER—auto tires & rubber covered steps, Rubber Step Mfg. Co., Exeter, N. H.
- EXIDE—storage ignition & vehicle batteries, Electric Storage Battery Co., 19th St. & Allegheny Ave., Phila., Pa.
- EXPERT—bicycles & tires, New York Sporting Goods Co., 17 Warren St., N. Y. City.
- EXPRESS—current indicators, Eldredge Electric Mfg. Co., 3 Post Office Square, Springfield, Mass.
- EXTRA—leather belting, Jewell Belting Co., 53 Trumbull St., Hartford, Conn.
- EXTRA WEAR—tire sleeves, Inner Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.
- EZE-GRIP—leather and rubber steering wheel covers, Hayne-Surridge Co., 1017 Lucas Ave., St. Louis, Mo.
- F.-B.—automatic clutch release for Buick Model 10, The F.-B. Company, Columbia, S. C.
- F. C. W. & CO.—gasoline storage outfits, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.
- F. H. B.—tire patches, The F. H. B. Co., Ithaca, N. Y.
- F. I. A. T.—spare parts, imported by The Hol-Tan Co., 1741 Broadway, N. Y. City.
- F & K—chimes, Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.
- F. & R.—double swivel vises, Fulton Machine & Vise Co., Lowville, N. Y.
- F. R. V.—shock absorbers, gears for autos, The F. R. V. Sales Co., Thoroughfare Bldg., N. Y. City.
- F-S—varnishes, Felton, Sibley & Co., 136-140 N. 4th St., Phila., Pa.
- F. & S.—annular ball bearings, imported by J. S. Bretz Co., 1004 Times Bldg., N. Y. City.
- F. & S.—clothing, Fuller & Sullivan, 11 to 19 Eliot St., Boston, Mass.
- FABRIKOID—imitation leather, The Fabrikoid Co., Newburgh, N. Y.
- FAHNESTOCK—spring binding posts, terminals & battery connections, The Fahnestock Electric Co., 129 Patchen Ave., Brooklyn, N. Y.
- FAHRIG—anti-friction metal, Fahrigr Metal Co., 316-322 Hudson St., N. Y. City.
- FAIRBANK—screw drivers, The Cassidy-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- FAIRBANKS-MORSE—marine gasoline engines & stationary gasoline engines, Fairbanks, Morse & Co., Chicago, Ill.
- FAIRFIELD—gasoline marine motors, The Consolidated Carpet Sewing Machine Co., Bridgeport, Conn.
- FALLS—auto & motorcycle tires, The Falls Rubber Co., Akron, O.
- FALLS—gasoline auto engines & feed glue jointers, Falls Machine Co., Sheboygan Falls, Wis.
- FAMOUS—bicycle tires, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- FAMOUS—oil & hand soap, Automobile Oil Co., 723 Baronne St., New Orleans, La.
- \*FARNLEY BEST YORKSHIRE—iron, imported by Houghton & Richards, 150 Oliver St., Boston, Mass.
- FARWELL—gear cutters, gear hobbing, molding machines, milling attachments for planers & sprue cutters, The Adams Co., Dubuque, Iowa.
- FASTNUT—lock washers, imported by S. Hoffnug & Co., Ltd., 116 Broad St., N. Y. City.
- FAUBER—crank hangers & sprockets, Great Western Mfg. Co., La Porte, Ind.
- FAULTLESS—gasoline marine motors, motor boat frames & hulls, Valley Boat & Engine Co., Baldwinsville, N. Y.
- FAULTLESS—inner tubes, Faultless Auto Tube Co., 1779 Broadway, N. Y. City.
- FAULTLESS—switches, Motsinger Device Mfg. Co., Pendleton, Ind.
- FAVORITE—juvenile foot and hand propelled vehicles, Toledo Metal Wheel Co., Toledo, Ohio.
- FAWN—magnetos, Fawn River Mfg. Co., Constantine, Mich.
- FAY JUVENILE—bicycles, The Pope Mfg. Co., Hartford, Conn.
- FEAR-NAUGHT—pneumatic auto tires, Dr. T. J. Cooper, 114 Water St., Paterson, N. J.
- FEATHERWEIGHT—marine gasoline engines, Elbridge Engine Co., Culver Road, Rochester, N. Y.
- FEDDERS—radiators, tanks, hoods & auto fenders, Fedders Mfg. Works, 57-59 Tonawanda St., Buffalo, N. Y.
- FEDERAL—bench planers, Edwin E. Bartlett, 326 A St., Boston, Mass.
- FEDERAL—steel lockers, shelving, filing cabinets, boxes & barrels, Federal Steel Fixture Co., 4545 W. Homer St., Chicago, Ill.

F

F. A. G.—German steel baus, imported by Peter Frasse & Co., 130-32 Worth St., N. Y. City.

- FELLOWS—gear cutters, The Fellows Gear Shaper Co., Springfield, Vt.
- FELLWOCK—wind shields & auto seats, The Fellwock Automobile & Mfg. Co., Evansville, Ind.
- FERRET—wrenches, Pederson Mfg. Co., 636-644 First Ave., N. Y. City.
- FERRO—carburetors, gasoline marine engines & castings, Ferro Machine & Foundry Co., 115 Wade Bldg., Cleveland, O.
- FERRY—steel cap & set screws, Ferry Cap & Set Screw Co., 2151 Scranton Road, Cleveland, O.
- FETZGER—universal joints, Fetzger Automobile Mfg. Co., Columbus & Walnut Sts., Galion, Ohio.
- FIAT—auto parts & supplies, imported by Fiat Automobile Co., 1786 Broadway, N. Y. City.
- FIAT—oils & grease, Pennsylvania Oil Works Co., 1771 Broadway, N. Y. City.
- FIBROVISCOS—gear lubricant, W. S. Sheppard, 22 Lawrence St., Newark, N. J.
- FIDELITY—waste, wiping rags, etc., J. Milton Hagy Waste Works, 433 Spruce St., Phila., Pa.
- FIELD—metal cements, Field Radiator & Boiler Compound Co., Auburn, Me.
- \*FIELD—stationary engines, The Field-Brundage Co., Jackson, Mich.
- FIFIELD—automatic drilling attachments, Fifield Bros. Co., 337 Water St., Augusta, Me.
- FINGA-BRITE—soaps & pastes (hand), Rath, Chas. H. Co., Inc., 1347 N. Front St., Phila., Pa.
- \*FIRE DUST—fire extinguishers, Leader Mfg. Co., 1808 Chestnut St., St. Louis, Mo.
- FIRE-FLY—ignition batteries, Hoosier Storage Battery Co., Evansville, Ind.
- FIRESTONE—tires, tire cements, tire repair articles, tire tools & tire repair pits, Firestone Tire & Rubber Co., Akron, O.
- FISCHBACK—gasoline marine motors, Fischback Mfg. Co., 3714 N. Madison Ave., Peoria, Ill.
- FISHER—magnetos & storage battery chargers, Fisher Mfg. Co., South Bend, Ind.
- FISHER & FISHER-BROOKS—machinists' & woodworkers' vises, Fisher & Norris, Trenton, N. J.
- FISHERMAN—gasoline marine motors, Loane-Hiltz Engineering Co., 320 S. Hanover St., Baltimore, Md.
- FISH SYSTEMS—timers, distributors, spark coils & generators, The Fish Systems Co., Indianapolis, Ind.
- FISHTAIL—propeller wheels, Mechanical Devices Co., Inc., Watervliet, N. Y.
- FSK—tires, Fisk Rubber Co., Chicopee Falls, Mass.
- FITCHBURG—files, Simonds File Co., Fitchburg, Mass.
- FITCHBURG—lathes, countersinking & radial drills, Fitchburg Machine Works, Fitchburg, Mass.
- FITE FIRE—fire extinguishers, Henry W. Landau, N. J. R. R. Ave., Newark, N. J.
- FITS-ALL—automobile lamp covers, Vehicle Apron & Hood Co., 198 E. Rich St., Columbus, Ohio.
- FITWELL—dowel pins, Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, O.
- FITZALL—lamp adapters, A. Nelson Mfg. Co., 564 W. Randolph St., Chicago, Ill.
- FITZALL—lamp adapters, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- FIVE BROTHERS—auto trimming leather, Chas. L. Klauder Co., B St. & Allegheny Ave., Phila., Pa.
- FIXAT-NITE—lamp stands, Arnold Auto Specialty Co., Garfield, N. J.
- \*FLASH—wrenches, Brock Wrench Mfg. Co., 18 Dey St., N. Y. City.
- FLASH—acetylene lamp lighters, Motor Specialties Co., Motor Mart, Boston, Mass.
- FLASH—carbon removers, Flash Mfg. Co., Zanesville, O.
- FLASH—cleansing compound (antiseptic), metal polishes & auto body cleansing compound, Flash Chemical Co., 9 & 10 Fulton St., Boston, Mass.
- FLASH—spark plugs, Acme Telephone & Mfg. Co., Albia, Iowa.
- FLASHLIGHT—spark plugs, Janney-Steinmetz & Co., 4th & Market Sts., Phila., Pa.
- FLAT BASE—cushion springs, Detroit Wire Spring Co., 21st & Standish Sts., Detroit, Mich.
- FLATHER—gear cutting machines, turret machines & boring mills, E. J. Flather Mfg. Co., Nashua, N. Y.
- FLEETWOOD—auto bodies, hoods & mud guards, Fleetwood Metal Body Co., Fleetwood, Pa.
- FLEETWOOD—scroll saws, Trump Bros. Machine Co., Wilmington, Del.
- FLEISCH—gaskets, Chicago Die & Stamping Co., Ravenswood Station, Chicago, Ill.
- \*FLEMING—vehicle chock, Flemming Vehicle Chock Co., 438 Garfield Ave., S. E., Washington, D. C.
- E. FLENTJE—fuel strainer & shock absorbers, Ernest Flentje, Cambridge & Trowbridge Sts., Cambridge, Mass.
- FLEUR DE LIS—dry batteries, French Battery & Carbon Co., Madison, Wis.
- FLEXO—fan belts, Detroit Leather Works, 84 Woodward Ave., Detroit, Mich.
- \*FLOUR CITY—stationary engines, Kinnard-Haines Co., Minneapolis, Minn.
- \*FLUFF-FOE—boiler & radiator compound, John Callahan & Co., 1119 Chamber of Commerce Bldg., Chicago, Ill.
- FLUXINE—for cleaning brass in furnaces, The Foundry Specialty Co., Cincinnati, Ohio.
- FOG-OFF—to prevent wind shield glass from becoming clouded in rain, The Bobrick Chemical Co., 111-117 S. Garey St., Los Angeles, Cal.
- FOOS—stationary engines, The Foos Gas Engine Co., Springfield, Ohio.
- FORBES—patent die stock, Curtis & Curtis Co., Bridgeport, Conn.
- FORD—demountable rims, Ford Demountable Rim Co., Bridgeport, Conn.
- FORD—repair links, Ford Repair Link Co., 147-150 Ann St., Bridgeport, Conn.
- \*FOREST CITY—flexible hose for horns, Forest City Rubber Co., 1543 Columbus Rd., N. W., Cleveland, O.
- FOREST CITY—paints, varnishes, lacquers & enamels, Forest City Paint & Varnish Co., 3334 Lakeside Ave., Cleveland, Ohio.
- FORG—gasoline burners, roller tube expanders, sprockets & door catches, Peter Forg, 50 Park St., Somerville, Mass.
- FORSYTH—cycle lamp brackets, coaster brakes, cone spanners, chain guards, brakes & cycle & motorcycle pedals, Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y.
- FORSYTH-DETACHABLE—brakes, Forsyth Mfg. Co., 308-314 Terrace, Buffalo, N. Y.
- FORT DOUGLASS XXX SPECIAL & FORT PUTNAM—oils, Dearborn Drug & Chemical Works, Chicago, Ill.
- FORT HILL—bearing bronze, Fort Hill Bronze Mfg. Co., 48-56 Waters Ave., West Everett, Mass.
- FORTIN UNIVERSAL—jigs, B. P. Fortin Tool Co., 73 Oakland Terrace, Woonsocket, R. I.
- FOSTER—shock absorbers, Gabriel Horn Mfg. Co., 1407 E. 40th St., Cleveland, Ohio.
- FOSTER—steering devices for trucks, The Columbus Screw & Machine Co., 244 Kaiser St., Columbus, Ohio.
- \*FOUCH—disc wheels, Fouch Disc Wheel Co., Room 11, Tribune Bldg., Minneapolis, Minn.
- 4-ALL—hand soap, Dr. H. Howard Levy, Inc., 44 W. 34th St., N. Y. City.
- \*FOURFORONE—spark plugs, Fourforone Spark Plug Co., 23 E. Lake St., Chicago, Ill.
- THE 400—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.
- 408 MOTOR—babbitt metal, Mogul Metal Co., 149-151 Larned St., Detroit, Mich.

**FOWLER**—lamp lighters, Fowler Lamp & Mfg. Co., 2337 Wabash Ave., Chicago, Ill.

**FOWLER, MANSON & SHERMAN**—bicycles, Fowler-Manson-Sherman Cycle Mfg. Co., 900-910 W. Lake St., Chicago, Ill.

**FOX**—marine gasoline engines, Dean Mfg. Co., South Cincinnati, Newport, Ky.

**FOY**—electric rear light & number holder, Jordan Equipment Co., Beverly, Mass.

**FRANCO-AMERICAN**—metal polish, Chana-vas & Son, 920 Eighth Ave., N. Y. City.

**FRANKLIN**—die castings & bushings, H. H. Franklin Mfg. Co., 402 S. Geddes St., Syracuse, N. Y.

**FRANKLIN**—oils, greases & soaps, Crescent Oil & Grease Co., Cleveland, Ohio.

**\*FRASER**—marine gasoline motors, Fraser Machine & Mfg. Co., 70 Freeport St., Boston, Mass.

**FREEMAN**—steel third seats & folding steel chairs, The Geo. B. Freeman Mfg. Co., 1415 Racine St., Racine Junction, Wis.

**\*FREEPORT**—stationary gas & gasoline engines, Stover Engine Works, Freeport, Ill.

**FRELASTIC**—varnishes, Cleveland Varnish Co., 3111 E. 87th St., Cleveland, Ohio.

**FRENCH**—oils & metal polishes, Marshall Oil Co., Marshalltown, Ia.

**FRENCH COMPRESSION FLUIDE**—cylinder cleaning compounds, French Compression Fluide Co., 62 S. Fair Oaks Ave., Pasadena, Cal.

**FRICTION**—wind shields, Newark Rivet Works, 262 Lafayette St., Newark, N. J.

**FRICTIONLESS**—white brass bearing metal, Frictionless Metal Co., Chattanooga, Tenn.

**FRIDAY'S**—dashboard mirrors, W. F. Eckstein, 1223 Michigan Ave., Chicago, Ill.

**FRISBIE**—gasoline marine motors & stationary engines, The Frisbie-Heft Motor Co., Middletown, Conn.

**FRISBIE-HEFT**—gasoline auto engines, The Frisbie-Heft Motor Co., Middletown, Conn.

**FRITCHLE**—storage batteries, The Fritchle Automobile & Battery Co., 1449-55 Clarkson St., Denver, Colo.

**FROST KING**—stationary engines, The John Lauson Mfg. Co., New Holstein, Wis.

**FROST QUEEN**—paste to prevent wind shield glass from becoming clouded, H. F. Schipper, Hamilton, Ohio.

**FRY**—spark plugs, Standard Sales Co., 123 W. 68th St., N. Y. City.

**FULERUM**—side chain connectors, The Cas-sady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.

**THE FULLER**—trunk racks, trunks, lunch & picnic cases, The G. W. Fuller & Co., 182 Asylum St., Hartford, Conn.

**FULMINA**—magnetos, imported by J. H. Lehman Mfg. Co., 500 Fifth Ave., N. Y. City.

**FULL TONE**—motor boat whistles, American Marine Lamp Mfg. Co., 261 Pearl St., N. Y. City.

**FULTON**—gasoline marine motors, Fulton En-gine Co., Erie, Pa.

**\*FULTON**—sensitive tapping machines, Fulton Foundry & Machine Co., 21 Furman St., Brooklyn, N. Y.

**\*FURNITURE-BRITE**—wood polish, Leader Mfg. Co., 1808 Chestnut St., St. Louis, Mo.

**FUTTERMAN WELDING OUTFITS**—welding equipment, New York Coach & Auto Lamp Co., 794-98 Tenth Ave., N. Y. City.

**FYBEROID**—insulating paper, Wilmington Fibre Specialty Co., Wilmington, Del.

**FYRICIDE**—fire extinguishers, Fyricide Mfg. Co., 34 Murray St., N. Y. City.

G

**G & A**—carburetors, A. J. Myers, 244 W. 49th St., N. Y. City.

**G.** E.—elec. automobile motors, controllers, elec. auto lamps, battery charging out-fits, mercury arc rectifiers, elec. buffers & grinders, magnetos, electric breast drills, current transformers, generator sets & rheostats, ignition cable, switches, air compressors & measuring gauges, Gen-eral Electric Co., Schenectady, N. Y.

**G. H. B. CO.**—steel & brass balls, Grant-Hoover Ball Co., Merchantville, N. J.

**G & J**—tires, grips, spring bumpers, rims, patches, tape, sheet rubber, sleeves, auto tire cases, cements, valve bases, gas bags & tire repair tools, G & J Tire Co., Indi-anapolis, Ind.

**G & K**—tire sleeves, Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worces-ter, Mass.

**G-L**—economizers, The Carburation Co., 825-29 Long Ave., N. W., Cleveland, O.

**G. & M.**—radiators, imported by Henry Du-casse & Co., 735 7th Ave., N. Y. City.

**G. O.**—tire cases, Gates-Osborne Mfg. Co., Marshalltown, Iowa.

**G-P**—tire pumps, power & storage pumps, air compressors, pressure gauges, oil & grease injectors, tire pressure registers, auto whistles, valves & storage tanks, Gleason-Peters Air Pump Co., 255-261 Classon Ave., Brooklyn, N. Y.

**G & S**—auto trunks, L. Goldsmith & Son, Cherry & Canal Sts., Newark, N. J.

**G W.**—metal polish & auto body soap, Great Western Oil Co., 2855 E. 37th St., Clevel-land, O.

**GABRIEL**—exhaust horns, shock absorbers & cut-out valves, Gabriel Horn Mfg. Co., 1407 E. 40th St., Cleveland, O.

**GADE**—stationary gas & gasoline engines, Gade Bros. Mfg. Co., Iowa Falls, Iowa.

**GALVIN**—carburetors & wind shields, Detroit Steering Wheel & Wind Shield Co., 271-288 Wight St., Detroit, Mich.

**GAMBURGER BIMSSTEIN**—composition pum-ice stones, R. E. Rodriguez, 56-58 War-ren St., N. Y. City.

**GANDY**—belting, belt dressing & brake bands, The Gandy Belting Co., 728-40 W. Pratt St., Baltimore, Md.

**GARDINER'S ANTI-RUST PAINT**—rust pre-venters, George N. Gardiner & Son, 15 William St., N. Y. City.

**GARDNER**—artificial lumber, Gardner Artifi-cial Lumber Co., 115 Broadway, N. Y. City.

**GARDNER**—engine starters & truss for "Ford" rear axles, Gardner Engine Starter Co., 1451-55 Michigan Ave., Chicago, Ill.

**GARDNER**—garage tire pumps, The Gardner Governor Co., Quincy, Ill.

**GARDNER**—stationary engines, The Gardner Motor Co., 5143 Delmar Blvd., St. Louis, Mo.

**GARDNER'S IMPROVED**—disc grinders, Gardner Machine Co., Beloit, Wis.

**\*GARGOYLE**—automobile Oil, The Vacuum Oil Co., Rochester, N. Y.

**GARLAND**—polishing & buffing machines, The Sibley-Houffley Machine Co., 189 Brush St., Detroit, Mich.

**GARLOCK**—packing & gaskets, Garlock Pack-ing Co., Palmyra, N. Y.

**GARNET**—wiping rags, Continental Waste Co., 22 Clayton St., Boston, Mass.

**GARVIN**—machinery, Garvin Machine Co., Spring & Varrick Sts., N. Y. City.

**GAS-TITE**—copper asbestos gaskets, Good-win & Kintz Co., Winsted, Conn.

**\*GAVELEK**—carburetors, Lustre Chemical Co., 1303 Michigan Ave., Chicago, Ill.

**GAY'S**—screw drivers, Geo. E. Gay, Augusta, Me.

**GEIER**—presses & boring tool holders, The P. A. Geier Co., 5112 St. Clair Ave., Clevel-land, Ohio.

**GEISZLER**—propulsion & ignition battery, Gelszler Bros. Storage Battery Co., 514 & 516 W. 57th St., N. Y. City.

**GEM**—acetylene gas generators, Gem Brass & Mfg. Co., 119-21 E. Walnut St., Des Moines, Iowa.

- \*GEM—collapsible cooker, Outdoor Cooker Co., 17 Cutler Bldg., Rochester, N. Y.
- GEM—grease cups, The Lunkenheimer Co., Cincinnati, O.
- GEM—lamp lighters, (electric), Electric Goods Mfg. Co., Canton, Mass.
- GEM—leather belting, Jewell Belting Co., 53 Trumbull St., Hartford, Conn.
- \*GEM—oil cans, lathe torches, breast drills, portable drills, grinders, polishing machines, foundry chaplets, Gem. Mfg. Co., Pittsburg, Pa.
- GEM—stationary gas & gasoline engines, Capital Gas Engine Co., West 21st St. & the Belt Railway, Indianapolis, Ind.
- GEM—stationary gasoline engines, Elbridge Engine Co., Culver Road, Rochester, N. Y.
- GEM—strainers, Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y.
- GEM—tool grinders & oil stones, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.
- GEMMER—steering devices, Gemmer Mfg. Co., 741-747 Merrick Ave., Detroit, Mich.
- \*GENCO—spark plugs, voltmeters, ammeters, vehicle batteries, battery connections, ignition cable, electric lamps, Gen Electrical Mfg. Co., 180 E. Lake St., Chicago, Ill.
- GENDRON—bicycles, Gendron Wheel Co., Toledo, Ohio.
- \*GENESEE—detachable auto tires, Thos. D. Buick Co., Flint, Mich.
- GENUINE—bearing metal, Merchant & Evans Co., 517 Arch St., Phila., Pa.
- GENUINE BARNES—pipe cutters, The Barnes Tool Co., New Haven, Conn.
- GEOMETRIC—adjustable collapsing taps, screw cutting die heads, milling tools, tap holders, reamers, special tools, screw machine products, Geometric Tool Co., Blake & Valley Sts., New Haven, Conn.
- \*GEYER—boat propellers, Marine Hardware Co., Peabody, Mass.
- GEYSER—gasoline & oil storage outfits & gasoline storage tanks, Geyser Oil Tank Co., Wayne & Clinton Sts., Fort Wayne, Ind.
- GIANT—key seaters, boring mills, band saw scarfers, keyseat milling machines, Mitts & Merrell, Saginaw, Mich.
- GIANT—indicator throttle valves, Wm. Powell Co., 2521-2531 Spring Grove Ave., Cincinnati, O.
- GIANT—universal joints, Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn.
- GIANT—wrenches, Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y.
- GIBNEY—automobile tires, J. L. Gibney & Bro., 215-17 N. Broad St., Phila., Pa.
- GIES—reverse gears, Gies Gear Co., 45 E. Fort St., Detroit, Mich.
- GILBERT—tire sleeves, fan & oiler belts, straps, auto tire cases, auto covers, auto lamp covers, steering knuckle boots, tool kits, tire irons, extra tire holders & locks, spark plug cases, starting handle covers, robe rail bags, etc., Gilbert Mfg. Co., New Haven, Conn.
- GIL-BO—lamp adapters, Metal Specities Mfg. Co., 427-441 Randolph St., Chicago, Ill.
- GILL—crank shafts, P. H. Gill & Sons Forge & Machine Works, Lorraine & Otsego Sts., Brooklyn, N. Y.
- GILLIAM'S—top dust hoods & radiator & engine covers, The Gilliam Mfg. Co., Canton, O.
- GILMER—sanders & fan belts, L. H. Gilmer Co., 52 N. 7th St., Phila., Pa.
- \*GILSON—gasoline auto engines, Gilson Mfg. Co., Port Washington, Wis.
- GILT EDGE—belting, I. B. Williams & Sons, Dover, N. H.
- GILT EDGE—metal polish, W. H. Cross & Ladd Co., 29 Murray St., N. Y. City.
- GIROD—electric furnaces & electric steel, C. W. Leavitt & Co., Cortlandt Bldg., 30 Church St., N. Y. City.
- GISHOLT—turret lathes, tool grinders & boring mills, Gisholt Machine Co., 1330 Washington Ave., Madison, Wis.
- GLADIATOR—sheet asbestos, gaskets, packing, boiler coverings & pipe coverings, New Jersey Asbestos Co., Camden, N. J.
- GLITTERSHINE—metal polish, Grady Mfg. Co., 509 W. 30th St., N. Y. City.
- GLOBE—battery cases, tool boxes, tumbling barrels, brass handles, robe rails & foot rests, The Globe Machine & Stamping Co., 3950 Hamilton Ave., N. E., Cleveland, O.
- GLOBE—bearing metals and ingots, Damascus Bronze Co., Pittsburg, Pa.
- \*GLOBE—brazing & soldering torches, Globe Brass Works, 15-17 Macomb St., Detroit, Mich.
- GLOBE—electric auto lamps, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- GLOBE—garage tire pumps, Globe Mfg. Co., Battle Creek, Mich.
- \*GLOBE—gasoline marine motors, Pennsylvania Iron Works, Eddystone, Pa.
- GLOBE—goggles, Globe Optical Co., 403 Washington St., Boston, Mass.
- GLOBE—manganese bronze & brass & bronze compositions, Globe Metal Co., 401 W. Ontario St., Chicago, Ill.
- GLOBE—metal polishes, Raimes & Co., 50 Ferry St., N. Y. City.
- GLOBE—power hack saws, West Haven Mfg. Co., 22 Elm St., New Haven, Conn.
- GLOBE—rubber hose & belting, United & Globe Rubber Mfg. Co., Trenton, N. J.
- GLOBE—tire holders, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- GLOBE—tool sharpeners, O. S. Walker & Co., 25 Union St., Worcester, Mass.
- GLOBE BLACK—packing, United & Globe Rubber Mfg. Co., Trenton, N. J.
- GLOSSERENE—wood polish, A. J. Mooney, 359-63 Ninth Ave., N. Y. City.
- GLOVEFIT—tire covers, The Post & Lester Co., 20 Sargeant St., Hartford, Conn.
- \*GOES LIKE SIXTY—gasoline stationary engines, Gilson Mfg. Co., Port Washington, Wis.
- GOETTLER—caps with goggles combined, M. Goettler Hat Co., 1260 S. Broadway, St. Louis, Mo.
- GOLD CROSS—varnish, Stewart-Mowry Co., 3214 Shields Ave., Chicago, Ill.
- GOLDEN GLITTER—metal polish, A. J. Mooney, 359-63 Ninth Ave., N. Y. City.
- GOLDEN GLOW—metal polish, Shi-Nal Co., 413 Emmet Road, Toledo, Ohio.
- GOLDEN SCEPTRE—metal polish, Rath, Chas H. Co., Inc., 1347 N. Front St., Phila., Pa.
- GOLDEN STAR—body polish, R. W. Morris Co., 17 E. Missouri Ave., Kansas City, Mo.
- GOLD METAL—cup grease, Monarch Mfg. Co., Council Bluffs, Iowa.
- GOLD METAL—files & rasps, Liveright Bros., Phila., Pa.
- GOLD METAL—fire extinguishers, Robinson Fire Apparatus Mfg. Co., 4520 N. 20th St., St. Louis, Mo.
- GOODRICH—tires (bicycle & auto), motorcycle belts & cements, B. F. Goodrich Co., Akron, Ohio.
- GOODSON—spark plugs, coils, switches, fire extinguishers, voltmeters, voltmeters & tire powder, Goodson Electric & Mfg. Co., 88-94 Point St., Providence, R. I.
- \*GOODWIN—under water exhaust, American Submerged Exhaust Co., 62 State St., Newburyport, Mass.
- GOODWORTH—leather tire protectors, The Republic Rubber Tire & Shoe Co., Inc., 793 10th Ave., N. Y. City.
- GOODYEAR—rims, auto & bicycle tires, & air bottle for inflating tires, Goodyear Tire & Rubber Co., Akron, Ohio.
- GOODYEAR DOOLITTLE—demountable rims, Goodyear Tire & Rubber Co., Akron, O.

- GORDON—sleeve protectors, magneto covers, crank handle holders, grease bags, auto & trunk covers, rawhide non-skid tire sleeves, radiator covers, auto robes, tire cases & trunks, tool bags & rolls, wind shields, inner tube cases, steering wheel covers, The Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, O.
- GORDON—storage & dry ignition batteries, Lutz-Lockwood Mfg. Co., Aldene, N. J.
- GORDON—spark plugs, Gordon Auto Supply Co., 1024 Boylston St., Boston, Mass.
- GORDON FITSALL—lamp covers, The Vehicle Apron & Hood Co., 272 N. 4th St., Columbus, O.
- GORTON—disc grinders, Diamond Machine Co., Providence, R. I.
- GORTON—engraving machines for hub caps, label plates, etc., high speed cutting off machines for gear blanks, George Gorton Machine Co., Racine, Wis.
- GOSHEN—gasoline auto & marine motors, Goshen Motor Works, Goshen, Ind.
- \*GO SUM—marine oil, Flint Oil Co., Providence, R. I.
- GOTHAM—spark plugs, The R. E. Hardy Co., 201 37th St., Brooklyn, N. Y.
- GOUL—grease cup fillers & grease guns, Tell City Foundry & Machine Works, Tell City, Ind.
- GOULD—propulsion & ignition batteries, Gould Storage Battery Co., 341 Fifth Ave., N. Y. City.
- GOULDS—air compressors & power pumps, The Gould Mfg. Co., Seneca Falls, N. Y.
- GRAB—pump connections, Motor Car Equipment Co., 55 Warren St., N. Y. City.
- GRABER—water gauges, Jenkins Bros., 71 John St., N. Y. City.
- GRACK-UNICUM—electric horn attachment & porcelain tubes, imported by Theo. H. Gary Co., 50-52 Franklin St., N. Y. City.
- GRADOMETER—grade meters, The Adams Co., Dubuque, Iowa.
- GRADY'S SCOUREE—metal polish, Grady Mfg. Co., 509 W. 30th St., N. Y. City.
- GRAHAM—axes, Chicago Recording Scale Co., Waukegan, Ill.
- GRAHAM—differential gears, Geo. H. Graham, 740 Monadnock Bldg., Chicago, Ill.
- GRAHAM'S—chucks, Detroit Twist Drill Co., 634-46 Fort St., W. Detroit, Mich.
- GRA KNIGHT—water-proof belting, Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass.
- GRANT—rivet spinning machines, tapping machines, bench screw slotters, & tool post grinders, The Grant Mfg. & Machine Co., 90 Silliman Ave., Bridgeport, Conn.
- \*GRANT-FERRIS—gasoline marine motor, Grant-Ferris Co., Troy, N. Y.
- GRAPHITOLEO—graphite, Jos. Dixon Crucible Co., Jersey City, N. J.
- GRAPHLIO—graphite & grease, Walter D. Carpenter Co., 39 Cortlandt St., New York City, N. Y.
- GRASELLI—battery acid, Grasselli Chemical Co., Cleveland, Ohio.
- GRASSER—gasoline marine motors, Grasser Motor Co., 104 Ottawa St., Toledo, Ohio.
- GRAY & DAVIS—oil automobile lamps, Gray & Davis, Amesbury, Mass.
- GRAY—auto & marine exhaust muffler cut-outs, Gray-Hawley Mfg. Co., 605-609 Fort St., W., Detroit, Mich.
- GRAY—motors, Gray Motor Co., Leib & Larned Sts., Detroit, Mich.
- GRAY'S—tire pumps, valve grinding compounds, rubber bumpers, gas bags, lamp connections, tire lugs, vulcanizing solution, cements & bow separators, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S BLANCO—tire sleeves, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S EVERWEAR—tire sleeves & grips, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S E-Z-RIDE—handle bar grips, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S FILL GUM—tire repair talc, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S FURNO-LAC—wood polish, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S INSERT—inner tire sleeves, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S MAGIC CARBO-SOL—carbon remover, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S RESISTO—tire sleeves, Standard Leather Washer Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S ROYAL—tire talc, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S SQUEEZE-IT—device for vulcanizing, Standard Leather Washer Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S VELVET—friction leather for brakes & shoes, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GRAY'S WATERPROOF—tire sleeves, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- GREASJAMMER—lubricant injectors, Motor Car Supply Co., 1451-1455 Michigan Ave., Chicago, Ill.
- GREAT ARROW—oil & grease, A. Geoghan & Son, Inc., 207 Newell St., Brooklyn, N. Y.
- \*GREAT SCOTT—carburetors, Scott & Sons Co., Fulton & Valley Sts., Medford, Mass.
- GREAT WESTERN—files & rasps, Nicholson File Co., Providence, R. I.
- GREENERD—arbor presses, Edwin E. Bartlett, 326 A St., Boston, Mass.
- GREENFIELD—reamer, cutter & tool grinders, Greenfield Machine Co., 29 Mill St., Greenfield, Mass.
- GREENLEE—woodworking machinery, planers & power hack saws, Greenlee Bros. & Co., Rockford, Ill.
- GREEN OIL—automobile soap, cutting compound & hand cleaning compounds, Monahan Antiseptic Co., 100 Market St., Chicago, Ill.
- GREENPORT—gasoline marine motors, J. S. Gaffga & Co., Greenport, N. Y.
- GREEN RIVER—bolt & nut machinery, drills, pipe cutting & threading machines, reamers, screw plates & taps & dies, Wiley & Russell Mfg. Co., Greenfield, Mass.
- GREOIL—grease, Wm. C. Robinson & Son Co., 336-342 North St., Baltimore, Md.
- GRE-SOLVENT—hand cleaner, The Utility Co., 636-638 W. 4th St., New York City.
- GREYHOUND—motorcycle parts, Greyhound Motor Works, 1443 Niagara St., Buffalo, N. Y.
- GRIFFIN—steam vulcanizers, Motor Tire Repair & Supply Co., 5918 Baum St., Pittsburgh, Pa.
- \*GRILLER—carburetors, W. H. O'Brien Co., 115 Dearborn St., Chicago, Ill.
- GRIMSHAW—insulating tapes, New York Insulated Wire Co., 114 Liberty St., Boston, Mass.
- GRINAWAY—radiator ornaments, Grinaway Statuary Co., 15 & 17 W. 18th St., N. Y. City.
- GRINNELL RIST-FIT—automobile gloves & mittens, Morrison-Ricker Mfg. Co., Grinnell, Ia.
- GRINNELL VENTILATED—gloves, Morrison-Ricker Mfg. Co., Grinnell, Ia.
- GRIP NUTS—lock nuts, Grip Nut Co., 1590 Old Colony Bldg., Chicago.
- GRIPSHANK—screw drivers, Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
- GRIP SHANK—upholstery buttons, Tockwotton Co., 79 S. Main St., Providence, R. I.
- GRONKVIST—automatic high speed chucks, Gronkvist Drill Chuck Co., 18-20 Morris St., Jersey City, N. J.

GRUVA—emery wheel dressers, Challenge Machine Co., Phila., Pa.  
 GUARDIAN—oil cups, H. B. Sherman Mfg. Co., 12 Barney St., Battle Creek, Mich.  
 \*GUERIN—wind shields, The Guerin Mfg. Co., Mansfield, Ohio.  
 \*GUMELASTIC—tire repair articles, The Gumelastic Tire Co., 920-922 Bolivar Rd., Cleveland, O.  
 GUIDE—electric auto lamps & motor boat lamps, gauge lamps, lamp fittings & electric dome lights, Guide Motor Lamp Mfg. Co., 2069 E. Fourth St., Cleveland, O.  
 GYREX—mixers, Gyrex Mfg. Co., 1777 Broadway, N. Y. City.

## H

HB—ball bearings, Hess-Bright Mfg. Co., 2102 Fairmount Ave., Phila., Pa.  
 HB—brake pedals & mufflers, The H. Brothers, 207 W. 43rd Court, Chicago, Ill.  
 H. B.—chisels, fullers, swages & pliers, & H. B. EAGLE—hammers, Vaughan & Bushnell Mfg. Co., Chicago, Ill.  
 H. & B.—hand hammers, Humason & Beckley Mfg. Co., New Britain, Conn.  
 H-C—magnetos, ignition batteries, dry, The Holtzer-Cabot Electric Co., Boston, Mass.  
 H & C—lockers, Hart & Cooley Co., New Britain, Conn.  
 H. & C.—tire inflators, H. & C. Tire Inflator Co., 22 N. Canal St., Dayton, O.  
 H. & CO.—taps & dies, Holroyd & Co., Watford, N. Y.  
 H. F.—gasoline automobile engines, The Hariman Motor Works, South Glastonbury, Conn.  
 H. & H.—babbitt metal, Fahrig Metal Co., 316-322 Hudson St., New York City.  
 H. & H.—tire tools, L. L. Heller, Water St., Binghamton, N. Y.  
 H. H. R.—fuel strainers, Harry H. Reynolds, 1205 Monadnock Block, Chicago, Ill.  
 H-P—body springs, Hess-Pontiac Spring & Axle Co., Pontiac, Mich.  
 H. P.—spark plugs, Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J.  
 H. S. & CO.—hood hinges, Hammacher, Schlemmer & Co., 13th St. & 4th Ave., N. Y. City.  
 H. & V. W.—metal lacquers, metal polish & dynamos, Hanson & Van Winkle Co., Newark, N. J.  
 HAASE—gasoline marine motors, Haase Motor Works, 1017 Lloyd St., Milwaukee, Wis.  
 HABIRSHAW—ignition cable, Habirshaw Wire Co., 253 Broadway, N. Y. City.  
 HADES, JR.—spark plugs, Igniter Appliance Co., 302 Elec. Bldg., Cleveland, Ohio.  
 HAGSTROM—auto & motorcycle blow-out patches, tire protectors & spark plugs, Hagstrom Bros. Mfg. Co., Lindsborg, Kans.  
 HAHN—acetylene lamp burners, J. B. Carroll, 217 W. Illinois St., Chicago, Ill.  
 HAINES—gasoline & oil storage tanks, pumps for garage use, gasoline & oil storage outfits & portable gasoline tanks, Haines Oil Measuring Pump Co., Harrisburg, Pa.  
 HALCOMB—high speed steels, Halcomb Steel Co., Syracuse, N. Y.  
 HALF-NELSON—tires, Half-Nelson Tire Co., 1919 Portland Ave., Minneapolis, Minn.  
 HALL—axe handle fasteners, Massachusetts Machine Shop, Inc., 98 Beacon St., Worcester, Mass.  
 HALL—carburetors, Chas. E. Hall Co., 106 Broadway, Buffalo, N. Y.  
 \*HALL—gasoline auto & marine engines & stationary engines, Hall Gas Engine Co., Bylesville, Ohio.  
 HALL—gasoline marine motors, Hall Gas Engine Mfg. Co., 430 S. Park Ave., Waukegan, Ill.  
 HALLADAY—carburetors, The Fowler Brass Works, Inc., 2333-35 Wabash Ave., Chicago, Ill.  
 HALLETT'S COLUMBIAN—wood polish, United Supply Agency, 912 Westminster St., Providence, R. I.  
 HAMILTON—carburetors, Gem Brass & Mfg. Co., 119-21 E. Walnut St., Des Moines, Iowa.  
 HAM'S GENUINE—oil automobile lamps, C. T. Ham Mfg. Co., Rochester, N. Y.  
 HAMILTON—saws, grinders, lathes, shapers, tenoners, planers, etc., The Bentel & Margadant Co., Hamilton, O.  
 HANCOCK—lubricators, oils & grease injectors, tire pumps, gasoline strainers, Hancock Mfg. Co., 776 E. Henry St., Charlotte, Mich.  
 THE HANDIEST TOOL IN THE SHOP—portable floor crane & hoist, Canton Foundry & Machine Co., 8th & Saxton Sts., Canton, Ohio.  
 HANDY—acetylene gas generators, R. E. Dietz Co., 60 Laight St., N. Y. City.  
 HANDY—automobile jacks, Osborne Pole & Shaft Co., Anderson, Ind.  
 HANDY—battery connections & spark plugs, Chicago Electric Mfg. Co., 523-29 Van Buren St., Chicago, Ill.  
 HANDY-BAR—belt dressing, Crescent Belt Fastener Co., 143 E. 23rd St., N. Y. City.  
 HANDY—hand auto tire pumps, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.  
 HANDY—hand soap & gasoline, New York Oil & Paint Co., 128 Maiden Lane, N. Y. City.  
 HANDY—valves, The Lunkenheimer Co., Cincinnati, O.  
 HANDY—oil cups, Bay State Stamping Co., 380 Chandler St., Worcester, Mass.  
 HANDY—vises, Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn.  
 HANKSCRAFT—gasoline motor boats & steering wheels, Hanksraft Co., 1220 Michigan Ave., Chicago, Ill.  
 HANS—fuel level indicators, National Gauge & Register Co., Minneapolis, Minn.  
 HANSEN—gauntlets, O. C. Hansen Mfg. Co., 352 E. Water St., Milwaukee, Wis.  
 HAPPY HIT—carburetors, The Zenith Motor Goods Co., 1841 Euclid Ave., Cleveland, Ohio.  
 HARGRAVES—gasket & washer cutters & countersinks, Cincinnati Tool Co., Norwood, Ohio.  
 HARLOW—auto & boat tops & cushions, Willard Harlow Mfg. Co., Janesville, Wis.  
 HARP—aluminum castings, brake pedals, brass & bronze castings, composition castings, foot rests, grease guns, handles, chimes, auto lamp brackets, auto mountings, auto clutch pedals, robe rails & tire holders, Theo. Harper, 139-145 Lafayette St., N. Y. City.  
 HARRIS—automobile oils, greases & metal polish, A. W. Harris Oil Co., 326-328 S. Water St., Providence, R. I.  
 HARRIS AUTOIL—oil, Harris Oil Co., Muncie, Ind.  
 HARRIS—automobile tires, Harris Tire & Rubber Co., Broad & Race Sts., Phila., Pa.  
 HARRIS—carburetors & gasoline marine motors, Delaware Machine Works, Wilmington, Del.  
 HARROUN—bumpers (to protect front of car), The Turner Brass Works, Sycamore, Ill.  
 HART—emery wheels & grinders, Detroit Emery Wheel Co., Detroit, Mich.  
 HART—lamp lighters, Hart & Fuller, 9 South St., Hartford, Conn.  
 HART—lubricators & oil pumps, Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.  
 HARTFORD—cycle & motorcycle tires, hood anti-rattlers, rubbers spring bumpers, Hartford Rubber Works, 691 Park St., Hartford, Conn.  
 HARTFORD—bicycles, The Pope Mfg. Co., Hartford, Conn.  
 HARTFORD—filing machines, Robinson Tool Works, Waterbury, Conn.  
 HARTFORD—gasoline marine motors, The Gray & Prior Machine Co., 90 Suffield St., Hartford, Conn.



- HARTFORD—leather belting, Jewell Belting Co., 53 Trumbull St., Hartford, Conn.
- HARTFORD—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.
- HARTFORD—screw machines, screw machine products, nuts & bolts, ball cups & cones, The Hartford Machine Screw Co., Hartford, Conn.
- \*HARTFORD—time switches for charging apparatus, Hartford Time Switch Co., 97 Warren St., N. Y. City.
- HARTFORD—under-water exhausts, B. A. Sellow, 756 Main St., Hartford, Conn.
- HARTFORD—universal joints, Hartford Automobile Parts Co., 80 Huyshope Ave., Hartford, Conn.
- HARTFORD—wind shields, The S. M. Supplies Co., 22-24 Lincoln St., Boston, Mass.
- HARTFORD-VINET—removable rims, The Hartford-Vinet Co., 150 Bay St., Jersey City, N. J.
- HARTMAN—boat propellers & reversing gears for motor boats, McFarland Foundry & Machine Co., Inc., Trenton, N. J.
- HARTMANN—aluminum-solder, The Hartmann Co., 134 W. 49th St., N. Y. City.
- HARTNESS—automatic dies, Jones & Lamson Machine Co., Springfield, Vt.
- HARVARD—vehicle & ignition batteries, American Storage Battery Co., 8 Congress St., Boston, Mass.
- \*HARVEY—spark plugs, The Harvey Auto Supply Mfg. Co., 320 Society for Savings Bldg., Cleveland, O.
- HARWOOD—terminals, Frank W. Morse, 516 Atlantic Ave., Boston, Mass.
- HASLUP—jacks, Haslup Motor Jack Co., Sidney, O.
- HATT—wood polish & varnish removers, Century Novelty Co., 241 Jefferson Ave., Detroit, Mich.
- HAVOLINE—automobile oil, Havoline Oil Co., 80 Broad St., N. Y. City.
- HAWES—storm aprons, auto tops & chain boots, Hawes Storm Front Co., 25 N. Hancock St., Coldwater, Mich.
- HAWKEYE—auto baskets, trunks & refrigerator baskets & buckets with lunch equipment, Burlington Basket Co., Burlington, Ia.
- HAWKEYE—wrenches, Hawkeye Wrench Co., Marshalltown, Iowa.
- HAW-MAN-CO—horns, pumps, radiators, carburetors & mufflers, Hawthorne Mfg. Co., Howard Ave. & Spruce St., Bridgeport, Conn.
- HAWTHORN—ignition batteries, annunciators, ignition cable & dynamos, magnetos, solder, grinders & electric motors for driving machinery, The Western Electric Co., N. Y. City.
- HAY-BUDDEN—anvils, Hay-Budden Mfg. Co., 254 N. Henry St., Brooklyn, N. Y.
- HAYDEN—wrenches & forgings, The Belden Machine Co., Whalley Ave. & Tyron St., New Haven, Conn.
- HAYDENVILLE—cocks, The Haydenville Co., Haydenville, Mass.
- HAZARD—gasoline auto motors, Hazard Engineering Co., Maple & Scherer Sts. & N. Y. C. R. R., Rochester, N. Y.
- HAZENOID—tire cements, Hazen-Brown Co., 100 South St., Boston, Mass.
- HEALD—piston rings, cylinder & internal grinders, Heald Machine Co., Worcester, Mass.
- HEALD—salve for chapped hands, The Erlcka Mfg. Co., Inc., 872-888 Liberty St., Springfield, Mass.
- HEALY—removable rims, Healy Leather Tire Co., Healy Bldg., N. Y. City.
- HEANEY'S—metal polish, auto body soaps, hand soaps & tan belts, Heaney Mfg. Co., 164 State St., Boston, Mass.
- HEART—water proof belting, Gratton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass.
- HEATH—auto wheels, Shortsville Wheel Co., Shortsville, N. Y.
- \*HEATH'S CHALLENGE—motorcycle belts, S. F. Heath & Co., 288 Columbus Ave., Boston, Mass.
- HECLA—anti-friction bronze, Thomas Paulson & Son, 13 Fulton St., Brooklyn, N. Y.
- \*HEIM—gasoline marine motors & motor boats, Heim Boat Co., 289 3rd St., Milwaukee, Wis.
- HEINEL—gasoline marine motors, Jones & Schumacher, 1100 West St., Wilmington, Del.
- HEINZE—sparkling coils, magnetos & timers, Heinze Electric Co., Lowell, Mass.
- HEITGER—carburetors, Heltger Carburetor Co., 205½-207½ W. South St., Indianapolis, Ind.
- HELA—auto lamp burners, American Lava Co., Chattanooga, Tenn.
- HELE-SHAW—clutches, Merchant & Evans Co., 517 Arch St., Phila., Pa.
- HELIOS—ignition & vehicle batteries, charging resistances & electric lamps, Helios Mfg. Co., Bridesburg, Pa.
- HELIOS—packing, Crandall Packing Co., Palmyra, N. Y.
- HELLER'S—files & rasps, steels & hand hammers, Heller Bros., 865 Mt. Prospect Ave., Newark, N. J.
- HELMET—automobile oils, grease & rust preventives, Chas. H. Besley & Co., 15-21 S. Clinton St., Chicago, Ill.
- HELMET TEMPER—taps, Chas. H. Besly & Co., 15-21 S. Clinton St., Chicago, Ill.
- HELVA-HARD-HITTER—power hammers, Novelty Iron Works, Dubuque, Iowa.
- HELWIG—pneumatic tools, drills, grinders & hammers, Helwig Mfg. Co., St. Paul, Minn.
- HELWIG—spark plugs, The Helwig-Lipsinski Co., 747 18th St., Detroit, Mich.
- HENDERSHOT—couplings, Manning, Maxwell & Moore, Inc., N. Y. City.
- HENDY—centering machines, Hendy Machine Co., Torrington, Conn.
- HENRY—anti-skid devices, The Steering Wheel Co., Sidney, Ohio.
- HEPCO—paints & enamels, imported by Holland Enamel & Paint Co., 142 Fulton St., N. Y. City.
- HERAEUS—resistance thermometers, electrical furnaces & fused quartz glass articles & silica ware, imported by Chas. Englehard, 32 Cortlandt St., N. Y. City.
- HERAEUS LE CHATELIER—pyrometers, imported by Chas. Englehard, 32 Cortlandt St., N. Y. City.
- HERBERT—gasoline auto & marine motors, Herbert Mfg. Co., Inc., Nazareth, Pa.
- HERCULES—belting, Thermoid Rubber Co., Trenton, N. J.
- HERCULES—carburetor floats & castings, Hercules Float Works, 200 Franklin St., Springfield, Mass.
- HERCULES—cranes & hoists, William S. Nicholls, 253 Broadway, N. Y. City.
- \*HERCULES—gasoline marine motors, Hercules Gas Engine Works, 349-351 Market St., San Francisco, Cal.
- HERCULES—ignition batteries, Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill.
- HERCULES—leather tire protectors & automobile tires, The Republic Rubber Tire & Shoe Co., 798 10th Ave., N. Y. City.
- HERCULES—nippers, Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
- \*HERCULES—pocket chair, Cherington Mfg. Co., Waukegan, Ill.
- HERCULES—screw drivers, John Stortz & Son, 210 Vine St., Phila., Pa.
- \*HERCULES—shock absorbers, Hercules Auto Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill.
- HERCULES—steel spring wire, C. Newman Wire Co., 143 Liberty St., N. Y. City.
- HERCULES—taps, reamers, counterbores, tire valve tools & bolt threading machines, E. F. Reece Co., Greenfield, Mass.
- HERCULES—valve lifting tools, Rothstein Mfg. Co., 1941-55 Park Ave., N. Y. City.
- HERMETIC—tire lugs, imported by Cryder & Co., 583 Park Ave., N. Y. City.
- HERO—storage ignition batteries, Ampvo Battery Co., 1607 Michigan Ave., Chicago, Ill.



- HERSHEY—curtain hooks, Hershey Hook Co., Lincoln, Neb.
- HERZ—distributors, timers, terminals, tire inflators, battery connections & ignition cable, Herz & Co., 203-205 Lafayette St., N. Y. City.
- HESS—auto axles & body springs, Hess Spring & Axle Co., Carthage, O.
- HESS-BRIGHT—magnetos, Hess-Bright Mfg. Co., 2102 Fairmount Ave., Phila., Pa.
- HETTINGER—gasoline auto engines, Hettinger Engine Co., Bridgeton, N. J.
- HEXAGON—iron & steel, Lockhart Iron & Steel Co., Pittsburg, Pa.
- HICKLEY—alternating current rectifiers, Como Electrical Co., Spring Lake, N. J.
- HICKORY NUT—auto rims, wheels, spokes, billets & rim strips, Crane & MacMahon, 8-10 Bridge St., N. Y. City.
- HI-FRE-CO.—spark plugs, High Frequency Ignition Coil Co., 126 E. 9th St., Los Angeles, Cal.
- HIGGIN—curtain fasteners, Higgin Mfg. Co., Newport, Ky.
- HIGH DUTY—balls, steel, brass & bronze, Standard Roller Bearing Co., cor. 50th & Lancaster Ave., Phila., Pa.
- HIGH DUTY—lubricators, The Biddison Mfg. Co., 1516 Williamson St., Madison, Wis.
- HIGH DUTY—shapers, Gould & Eberhardt, 99 N. J. R. R. Ave., Newark, N. J.
- HIGH DUTY—spark plugs, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- HIGH DUTY GERMAN—steel balls, Herman Boker & Co., 101 Duane St., New York City.
- HIGH-DUTY-METAL—valves, National Tube Co., Frick Bldg., Pittsburg, Pa.
- HIGH EFFICIENCY—storage ignition & vehicle batteries, Tray Plate Battery Co., 24 Wall St., Binghamton, N. Y.
- HIGH PRESSURE—air compressors, Thos. W. Pangborn Co., 90 West St., N. Y. City.
- \*HIGH PRESSURE—brazing forges, enamels, cycle vulcanizers, enameling ovens, grease, & brazing compounds, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
- HIGH SPEED—nickel & vanadium steel, Colonial Steel Co., Pittsburg, Pa.
- HIGH STANDARD—paints & colors, The Lowe Bros. Co., Dayton, O.
- HIKO—commutator compound, carbon brushes & soldering sticks, Como Electrical Co., Spring Lake, N. J.
- HILAMAN—gasoline cycle motors, forks & vaporizers, A. L. Hilaman Co., Moorestown, N. J.
- \*HILDRETH—gasoline marine motors, The Hildreth Mfg. Co., 49 W. Hill St., Lansing, Mich.
- HILL—auto hand tire pumps, Judd & Leland Mfg. Co., Clifton, Springs, N. Y.
- HILL—automobile bodies, cushions, tops, revolving auto & boat seats & wind shields, The Hill Mfg. Co., 25-27 Fuller St., Buffalo, N. Y.
- HILL—boring bars, lathe dogs, tool holders, drill press & lathe & planer tools, Hill Standard Mfg. Co., Anderson, Ind.
- HILL—gasoline lock valves, Janney, Steinmetz & Co., 4th & Market Sts., Phila., Pa.
- HILL—milling machine dogs, universal grinder dogs & hold back & face-plate dogs, M. B. Hill Mfg. Co., Worcester, Mass.
- HILLMAN—tire brackets, wind shields, foot rests & robe rails, Hillman Auto Supply Mfg. Co., 485 Tremont St., Boston, Mass.
- HILL PRECISION—oilers, Precision Appliance Co., 2315 Austin Ave., Chicago, Ill.
- HI-LO—grease, Manhattan Oil Co., 51 Front St., N. Y. City.
- HILLO—varnishes, Moller & Schumann Co., Marcy & Flushing Aves., Brooklyn, N. Y.
- HILTON—safety starting cranks, Hilton Mfg. Co., 15 State St., Boston, Mass.
- HINDLEY—steering gears, M. L. Bayard & Co., Woodbine, N. J.
- HINDOSTAN—oilstones, Pike Mfg. Co., Pike, N. H.
- HINE-WATT—voltmeters, ammeters, volt-ammeters and oil guns, Hine-Watt Mfg. Co., 47 E. Randolph St., Chicago, Ill.
- HI-PO—ignition batteries, Lincoln Electric Co., 1 Union Square, N. Y. City.
- HISEY—portable electric grinders & drills, Hisey-Wolf Machine Co., Cincinnati, O.
- HI-TENSION—hard rubber & hard rubber bushings, Massachusetts Chemical Co., Wapole, Mass.
- HI-UP—ignition batteries, Manhattan Electrical Supply Co., 17 Park Place, N. Y. City.
- HJORTH—wrenches, William Hjorth & Co., Jamestown, N. Y.
- HOADLEY—valve lifting tools, automatic, F. B. Hoadley, 479 Willow St., Waterbury, Conn.
- HOBBS—flexible driving shafts & engine starters, Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.
- HOBBS—patent radiator protectors, Cisler & Serson, 3111 Michigan Ave., Chicago, Ill.
- HOBIN—nut lock washer, Border Bolt & Nut Lock Co., Richmond, Ind.
- HOB0—ignition batteries, Hoosier Storage Battery Co., 212-216 E. Pennsylvania St., Evansville, Ind.
- HODGMAN—clothing & top materials, Hodgman Rubber Co., 806 Broadway, N. Y. City.
- HODGSON—portable auto houses, E. F. Hodgson Co., 116-118 Washington St., Boston, Mass.
- HOEFER—spring coiling & knotting machines, Frank L. Wells Co., Kenosha, Wis.
- HOFFECCKER—speed indicators combined with odometer, Hoffecker Co., Park Square Motor Mart, Boston, Mass.
- HOFFMAN'S—boat paints, J. W. Hoffman Co., 8 Medford St., Boston, Mass.
- HOFFMAN—steel balls, imported by R. I. V. Co., 1771 Broadway, N. Y. City.
- HOLCKER-ELBERG—wood automobile bodies, automobile tops & wind shields, Holcker-Elberg Mfg. Co., N. E. Cor. 16th & McGee Sts., Kansas City, Mo.
- HOLCOMB—tops, Holcomb Co., 105 Goffe St., New Haven, Conn.
- HOLDFAST—tire protectors, Foskett & Co., 226-28 La Salle St., Chicago, Ill.
- HOLD-TIGHT—vise, Empire Mfg. Co., 200 E. Exchange St., Akron, Ohio.
- HOLLAND—enamels, imported by Holland Enamel & Paint Co., 142 Fulton St., N. Y. City.
- HOLLANDS—vises, Hollands Mfg. Co., Erie, Pa.
- HOLLEY—carburetors, Holly Bros. Co., 661-73 Beaubien St., Detroit, Mich.
- HOLLIDAY—marine gasoline engines, stationary engines, friction pulleys & reverse gears, Holliday Engineering Co., 749 Bunker St., Chicago, Ill.
- \*HOLTZ—timers, Illinois Automobile & Parts Co., Peoria, Ill.
- HOLYOKE—tire protectors, Holyoke Tire Protector Co., Holyoke, Mass.
- HOME—auto tires, inner tubes & tire repair sleeves, Home Tire Co., Trenton, N. J.
- HOMO—fuel economizers, Gasoline Motor Efficiency Co., 1 Exchange Place, Jersey City, N. J.
- HONK—radiator ornaments, Grinaway Statuary Co., 15 & 17 W. 18th St., N. Y. City.
- HOOSIER—storage batteries, Hoosier Storage Battery Co., 212-216 E. Pennsylvania St., Evansville, Ind.
- HOOSIER KNOXALL—auto body cleansing compounds, Hoosier Mfg. Co., Indianapolis, Ind.
- HOPEWELL—tire cases, rolls, vests, robes & automobile lamp covers, Hopewell Bros., 29 Chapel St., Newton, Mass.
- HOPKINS—varnish, National Varnish & Color Co., 85-91 Vesey St., Newark, N. J.
- HOPKINSON—drill vises, Hopkinson Machine Works, 23 Taylor St., Springfield, Mass.
- HORN—speed indicators, Industrial Instrument Co., Foxboro, Mass.

**HORNET**—belting & gaskets, Thermold Rubber Co., Trenton, N. J.  
**HORNET**—spark coils, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.  
**HORSESHOE**—leather auto tires, Racine Auto Tire Co., Racine, Wis.  
**HORSESHOE**—wooden wheels, Hagerstown Spoke & Bending Co., Hagerstown, Md.  
**HORSEY**—tire repair articles, Horsey Mfg. Co., 1246 Euclid Ave., Cleveland, O.  
**HORTON**—chucks, The E. Horton & Son Co., Windsor Locks, Conn.  
**HOSKINS**—electric furnaces & pyrometers, Hoskins Mfg. Co., Detroit, Mich.  
**HOSMERS**—liquid shellac, Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.  
**HOTCHKISS**—spare parts, imported by Hotchkiss Import Co., 20 W. 60th St., N. Y. City.  
**HOTSHOT**—magnetos, The Igniter Appliance Co., 302 Electric Bldg., Cleveland, O.  
**HOUGHTON'S**—cutting compounds & belt dressing, E. F. Houghton & Co., 240 W. Somerset St., Phila., Pa.  
**HOWARD**—machinists' vises, Howard Iron Works, Buffalo, N. Y.  
**HOWLER**—whistles, auto, O. Fenstermacher, 311 S. 5th St., Minneapolis, Miss.  
**HOYT**—bushings, Hoyt Metal Co., Merchants LaCade Bldg., St. Louis, Mo.  
**HOYT**—carburetors, F. C. Hoyt, 141 Massachusetts Ave., Boston, Mass.  
**HOYT**—voltmeters & ammeters, Hoyt Electrical Instrument Works, Penacook, N. H.  
**HOYT'S**—gas engine babbitt & HOYT'S NICKEL GENUINE—bearing metal, Hoyt Metal Co., Merchants LaCade Bldg., St. Louis, Mo.  
**HOYT-TRIUNE**—voltammeters, Hoyt Electrical Instrument Works, Penacook, N. H.  
**HUB**—bearing metal, The "Hub" Foundry & Plating Co., Ossining, N. Y.  
**HUBBARD'S & HUBBARD'S PAMEACHA**—case hardening bone, The Rogers & Hubbard Co., Middletown, Conn.  
**HUBBELL**—riveting & tapping machines, slotters, screws & lamp guards, Harvey Hubbell, Inc., Bridgeport, Conn.  
**\*HUB**—grease & oil guns, Hub Auto Supply Co., Middletown, Conn.  
**HUBLER-DAYTON**—storage batteries, Dayton Electrical Mfg. Co., 89 St. Claire St., Dayton, Ohio.  
**HUDSON**—bicycles, Miami Cycle & Mfg. Co., Grand Ave., Middletown, Ohio.  
**HUDSON BRAND**—asphalt felt, Asphalt Ready Roofing Co., 136 Water St., N. Y. City.  
**HUDSON'S EXTRA**—leather belting, Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.  
**HUDSON-FULTON**—ignition storage batteries, The Storage Battery Supply Co., 239 E. 27th St., N. Y. City.  
**HUFF**—automobile houses, E. Huff, Jr., 51 Union St., Portland, Me.  
**\*HUHN**—self-lubricating rings, American Huhn Metallic Packing Co., 1876 Broadway, N. Y. City.  
**HUMMING BIRD**—gasoline marine motors, Alexander & Cox Co., Ogden & Western Aves., Chicago, Ill.  
**\*HUMPHREY**—tire protectors, J. Humphreys, 1021 N. E. Payne Ave., Cleveland, Ohio.  
**100-MILE ELECTRIC**—vehicle batteries, The Fritchle Automobile & Battery Co., 1510-30 Clarkson St., Denver, Colo.  
**HUNT**—grease guns & grease storage tanks, The Hunt Mfg. Co., East Second St., Ottumwa, Iowa.  
**HUNTINGTON**—emery wheel dressers, Chicago Screw Co., 1020-1026 Homan Ave., Chicago, Ill.  
**HUNTINGTON**—emery wheel dressers, Warren Axe & Tool Co., Warren, Pa.  
**HUNTINGTON**—emery wheel dressers, Challenge Machine Co., Inc., 1516 Springfield Ave., Phila., Pa.  
**HURCK**—motorcycle coaster brakes, Hurck Motor & Cycle Co., 109 N. 12th St., St. Louis, Mo.

**HURRIUP**—funnels, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.  
**HUSK**—chimes, Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
**HUSSEY**—bicycle handle bars, Consolidated Mfg. Co., 1710 Fernwood Ave., Toledo, O.  
**HYATT**—roller bearings, Hyatt Roller Bearing Co., Newark, N. J.  
**HYCAP-EXIDE**—vehicle ignition batteries, Electric Storage Battery Co., 19th St. & Allegheny Ave., Phila., Pa.  
**\*HYDEGRADE**—waterproof coats, Regal Coat Co., 36 E. 12th St., N. Y. City.  
**HYDRAULIC**—clutch leather, Geo. Rahmann & Co., 6 Ferry St., N. Y. City.  
**HYDRAULIC**—wind shields, Emil Grossman Co., 296 Broadway, N. Y. City.  
**HYDREX**—mufflers & underwater exhausts, Hydrex Silent Exhaust Works, Dansville, N. Y.  
**HYDRO CARBONATED BONE-BLACK**—case hardening bone, E. F. Houghton & Co., 240 W. Somerset St., Phila., Pa.  
**HYDRO CARBON**—carburetors, The Hydro Carbon Machine Co., 431 Blomfield Ave., Newark, N. J.  
**\*HYDROCURVE**—gasoline marine motors & boat hulls, Hydrocurve Boat Co. of America, 3945-50 Olive St., St. Louis, Mo.  
**HYGLO**—metal polishes, John T. Stanley, 650 W. 30th St., N. Y. City.  
**HYRAY**—electric auto lamps, Electric Storage Battery Co., 19th St. & Allegheny Ave., Phila., Pa.

# I

**I. H. C.**—stationary gasoline engines, International Harvester Company of America, 7 Monroe St., Chicago, Ill.  
**I & M**—nuts, bolts, hub caps, wind shields, washers, brake drums & wheel flanges & housings, Ireland & Matthews Mfg. Co., Detroit, Mich.  
**\*I. X. L.**—cements & vulcanizing solutions, Rea Bros. & Co., Minneapolis, Minn.  
**I. X. L.**—lathe chucks, Westcott Chuck Co., Oneida, N. Y.  
**I. X. L.**—varnish, Edward Smith & Co., 129 West Ave., Long Island City, N. Y.  
**ICY-HOT**—vacuum bottles & jars, The Icy Hot Bottle Co., 216-218 Longworth St., Cincinnati, Ohio.  
**IDEAL**—auto bumpers, J. H. Sager Co., 265 South Ave., Rochester, N. Y.  
**IDEAL**—automobile jacks, Elite Mfg. Co., Ashland, Ohio.  
**IDEAL**—automobile & marine motors, Ideal Mfg. Co., Portsmouth, Ohio.  
**IDEAL**—automobile tops, covers & wind shields, The Ideal Wind Shield Co., 1926 Broadway, N. Y. City.  
**IDEAL**—bicycles, The Pope Mfg. Co., Hartford, Conn.  
**IDEAL**—bicycle & motorcycle handle bars, seat posts & handle bar stems, Ideal Plating Co., Inc., Marlboro, Mass.  
**\*IDEAL**—chest protectors, Ideal Chest Protector Co., 100 Sixth St., S. E., Washington, D. C.  
**IDEAL**—clamps, machinists, William S. Nicholls, 253 Broadway, N. Y. City.  
**IDEAL**—curtain fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.  
**IDEAL**—cushion springs, Foster Bros. Mfg. Co., Utica, N. Y.  
**IDEAL**—distributors, The Altemus Mfg. Co., 42nd & Chestnut Sts., Phila., Pa.  
**IDEAL**—gasoline marine motors, V. J. Emery Wollaston, Mass.  
**IDEAL**—gasoline storage outfits, Wallmann Mfg. Co., 283-285 5th Ave., Milwaukee, Wis.  
**\*IDEAL**—gasoline strainers, T. L. Phillips, Aurora, Ill.  
**IDEAL**—grease cups, The Lunkenheimer Co., Cincinnati, Ohio.  
**IDEAL**—hand planers, clamps & foot power drill grinders, Ideal Machine Works, 255-257 39th St., Brooklyn, N. Y.

- IDEAL—lamp lighters, U. E. Lazelle & Co., Battle Creek, Mich.
- IDEAL—lathes, Springfield Machine Tool Co., Springfield, O.
- IDEAL—oils (jobbers), Fidelity Oil Co., 600-602 W. 6th St., Kansas City, Mo.
- IDEAL—oil & grease, W. S. Sheppard, 22 Lawrence St., Newark, N. J.
- IDEAL—oil auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.
- IDEAL—paints, Bronze Powder Works Co., Elizabeth, N. J.
- IDEAL—pipe vices, The Orange Machine & Mfg. Co., 10-14 Stetson St., Orange, N. J.
- IDEAL—surface grinders, O. S. Walker & Co., Worcester, Mass.
- IDEAL—switches, Ideal Switch Co., Inc., Plainville, Conn.
- IDEAL—tire cases, Joseph Murray, Newton, Mass.
- IDEAL—vehicle washers & water savers, Ideal Carriage Washer & Automatic Water Saver Co., 383 Main St., E., Rochester, N. Y.
- IDEAL—water motors, Tessmer Machine & Tool Co., 285-287 Rivard St., Detroit, Mich.
- IDEALO—soap & metal polish, Idealo Co., 228 N. 4th St., Phila., Pa.
- ILSLEYS GRAPHITE AUTOGREASE—grease, Ilsley-Doubleday & Co., 229-231 Front St., N. Y. City.
- IMMUNITY—cable, The Post & Lester Co., 20 Sargeant St., Hartford, Conn.
- IMPERIAL—automobile lamp brackets, pressure regulators & tire pump compounds, Imperial Brass Mfg. Co., 441 S. Jefferson St., Chicago, Ill.
- IMPERIAL—auto pneumatic tires & inner tubes, McGraw Tire & Rubber Co., Grant Blvd. & 33rd St., Pittsburg, Pa.
- IMPERIAL—burners, M. Kirchberger & Co., 339 Broadway, N. Y. City.
- IMPERIAL—bicycles, The Pope Mfg. Co., Hartford, Conn.
- IMPERIAL—chain hoist, hand power traveling cranes, The Franklin Moore Co., Winsted, Conn.
- IMPERIAL—compression couplings, Thermoid Rubber Co., Trenton N. J.
- IMPERIAL—drills, hammers, pneumatic tools & hoists, Ingersoll-Rand Co., 11 Broadway, N. Y. City.
- IMPERIAL—gasoline & kerosene marine motors, Imperial Gas Engine Co., 60 Clementina St., San Francisco, Cal.
- IMPERIAL—hand cleansing compound & anti-freezing compound, Kielgass-Lehman Co., 208 W. Kinzie St., Chicago, Ill.
- IMPERIAL—metal polish, Rath, Chas. H. Co., Inc., 1347 N. Front St., Phila., Pa.
- IMPERIAL—rubber bumpers, Boston Belting Co., 256-60 Devonshire St., Boston, Mass.
- IMPERIAL—sparking tubes, Imperial Porcelain Works, Trenton, N. J.
- IMPERIAL—tire powder, American Talc Co., 22-24 Custom House St., Boston, Mass.
- IMPERIAL—wooden automobile wheels, Imperial Wheel Co., Flint, Mich.
- IMPERIAL WIXON—tire pumps, The Imperial Brass Mfg. Co., 241-249 S. Jefferson St., Chicago, Ill.
- IMPROVED AUTOMATIC—wind shields, B. & B. Mfg. Co., 6208 Cedar Ave., Cleveland, O.
- IMPROVED ELECTRO CORNO—Electric auto & boat horns, Improved Electro Corno Co., 48 W. 34th St., N. Y. City.
- IN-A-JIF—tire cements, Diamond Rubber Co., Akron, O.
- INCOMPARABLE—soldering fluid, Reade Mfg. Co., Hoboken, N. J.
- INDESTRUCTIBLEITE—metal sheets, wire, castings, rods & special shapes & metal tubing, Indestructibile Metal Co., 50 Church St., N. Y. City.
- INDESTRUCTIBLE—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.
- INDESTRUCTIBLE—spark plugs, American Coil Co., Foxboro, Mass.
- INDESTRUCTO—trunks, National Veneer Products Co., Mishawaka, Ind.
- INDEX—funnels, Whitnell T. Taliaferro, 258 Broadway, N. Y. City.
- \*INDEX—speed indicators combined with odometers, Index Speed Indicator Co., 719 Hennepin Ave., Minneapolis, Minn.
- INDIA—oil stones, Norton Grinding Co., Barbers Crossing, Worcester, Mass.
- INDIAN—motorcycle stands, Hendee Mfg. Co., 837 State St., Springfield, Mass.
- INDIAN—oil, grease & gasoline, Indian Refining Co., Cincinnati, O.
- INDIAN—spark plugs, auto hand tire pumps, engine starters, speed change gears, American Machine Co., Eau Claire, Wis.
- INDIANA—cycle & motorcycle tires, Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
- INDIA RUT RIDER—auto pneumatic tires, India Rubber Tire Co., 1461 Michigan Ave., Chicago, Ill.
- INDISPENSABLE—ball hanger bearings, pipe fittings, stuffing boxes, underwater exhausts, flexible couplings & marine engine fittings, Mechanical Devices Co., Inc., Watervliet, N. Y.
- INDUCTIO—stationary gasoline engines, Chas. E. Duryea, Reading, Pa.
- INGERSOLL—automobile clocks & watches, Robt. H. Ingersoll & Bro., 45 John St., N. Y. City.
- INGERSOLL—milling machines, The Ingersoll Milling Machine Co., Rockford, Ill.
- ING-RICH—signs, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.
- INITIATIVE—revolution counters, Schuchardt & Schutte, 90 West St., N. Y. City.
- INJECTOR—sand blasts, C. Drucklieb, 132 Reade St., N. Y. City.
- INNER-LAP—tire cases, Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo.
- INNERSHU—inner tube protectors, Inner Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.
- INST—lamp lighters, The Inst Lighter Co., Columbus, Ohio.
- \*INTER-LUBE—oil (for use in gasoline), The Igniter Appliance Co., 302 Electric Bldg., Cleveland, Ohio.
- INTER-LUBE—oil, Whitney Chemical Co., 6122 Euclid Ave., Cleveland, O.
- INTERNATIONAL—aluminum solder, International Solder Co., Syracuse, N. Y.
- INTERNATIONAL—taximeters, International Taximeter Co. of America, 1974 Broadway, N. Y. City.
- INVADER—oils, lubrication compound & semi-fluid transmission compound, Charles F. Kellom & Co., 113 Arch St., Phila., Pa.
- INVINCIBLE—ignition batteries, American Battery Co., 1132-34 Fulton St., Chicago, Ill.
- \*INVINCIBLE—tire protectors & anti-skid devices, Invincible Tire Armor Co., Hartley, Iowa.
- IRISH—ignition storage batteries, The Motor Car Supply Co., 1451-55 Michigan Ave., Chicago, Ill.
- IRLAND—wrenches, Charles T. Luce Company, 160 Congress St., Boston, Mass.
- IRVING—overhead vehicle washers & automatic water cut-off, I. J. Smith Mfg. Co., Inc., 4283 Park Ave., N. Y. City.
- ISOLIT—insulation for spark plugs, Imported by Theo. H. Gary Co., 50-52 Franklin St., N. Y. City.
- \*ISOTTA—spark plugs, Eli J. Bushey, 1777 Broadway, N. Y. City.
- ISTI—rear signals, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- \*IT—lock-nut, Lock-Nut "It" Concern, 6243 Greenwood Ave., Chicago, Ill.

## J

- \*J. A. G.—boat steering apparatus, J. A. Garrett, Auburn, N. Y.
- J. A. W.—spark plug cases, A. P. Stillman, 124 Chambers St., N. Y. City.

- J & B—coils, vibrators, switches & spark indicators, Jacobson-Brandow Co., 126 Columbus Ave., Pittsfield, Mass.
- J-D—spark plugs, Jeffery-Dewitt Co., 217-219 High St., Newark, N. J.
- J-M—asbestos wood, H. W. Johns-Manville Co., 100 William St., N. Y. City.
- J & R—spray hoods, boat, Jones & Robinson, City Island, N. Y.
- J. S. & Co.—air tanks, seamless steel tanks, boiler shells, gasoline tanks & brake drums, Janney-Steinmetz & Co., 4th & Market Sts., Phila., Pa.
- JACK OF ALL TRADES—stationary gasoline engines, Fairbanks, Morse & Co., Chicago, Ill.
- \*JACKSON—belt fasteners, Sawyer Belting Co., Cleveland, O. (Mfrs Agents.)
- JACOBSON—wind shields, Jacobson Bros., Bergen St. & 14th Ave., Newark, N. J.
- JAGER—gasoline & kerosene marine engines & lighting outfits for motor boats, Chas. J. Jager Co., 281-285 Franklin St., Boston, Mass.
- JAMES—check valves, Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y.
- JAMES-COMPACT—marine carburetors, Generator Valve Co., 294-296 Taaffe Place, Brooklyn, N. Y.
- JANETTE—luggage carriers, New York Sporting Goods Co., 17 Warren St., N. Y. City.
- JANUS—vacuum bottle, Jannus Vacuum Goods Co., 10 Beach St., N. Y. City.
- JAR-LESS—shock absorbers, The Jar-Less Shock Absorber Co., 172 Oliver St., Boston, Mass.
- JAYAITCHEFF—brake lining & carburetor floats, Jayaitcheff Co., Baltimore, Md.
- JEFFERY—marine glue, L. W. Ferdinand & Co., 201 South St., Boston, Mass.
- JELCO—auto tires & inner tubes, J. Ellwood Lee Co., Conshohocken, Pa.
- JENATZY—tires, imported by Jenatzy Rubber Co., 36 W. 43rd St., N. Y. City.
- JENCICK—gasoline automobile motors, Jencick Motor Co., Port Chester, N. Y.
- JENKINS—valves & packing, Jenkins Bros., 71 John St., N. Y. City.
- JERICHO—exhaust horns, Randall-Faichney Co., 251 Causeway St., Boston, Mass.
- JEWEL—electric lamp lighters, Electric Goods Mfg. Co., Canton, Mass.
- JEWEL—grease cups, The Lunkenheimer Co., Cincinnati, Ohio.
- JEWEL—ignition batteries, Jewel Electric Co., 271-273 Michigan Ave., Chicago, Ill.
- JEWEL—spark plugs, Pittsfield Spark Coil Co., Dalton, Mass.
- JIFFY—tire repair tools & kits, B. F. Goodrich Co., Akron, Ohio.
- JITSU—curtain fasteners, The L. & D. Co., 88 Broad St., Boston, Mass.
- JOE'S—reversing gears for motor boats, Snow & Petrelli Mfg. Co., 441-445 Chapel St., New Haven, Conn.
- JOHANSSON'S—standard measuring gauges, Gronkvist Drill Chuck Co., 18-20 Morris St., Jersey City, N. J.
- \*JOHNSON—gasoline marine motors, Johnson Bros. Co., Terre Haute, Ind.
- \*JOHNSON—gasoline marine motors, A. P. Johnson, 11 N. Ohio Ave., Atlantic City, N. J.
- JOHNSON—gasoline marine motors, Johnson & Wells Machine Co., Neenah, Wis.
- JOHNSON—friction clutches for machine shop equipment, reverse gears & boat clutches, The Carlyle Johnson Machine Co., P. O. Box D, Manchester, Conn.
- IVER JOHNSON—bicycles, Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
- JOLIET—fire extinguishers, The Chas. C. Wilcox Co., 115-27 Cass St., Joliet, Ill.
- JONES—auto & bicycle speed indicators, also motor boat speed indicators, odometers, automobile clocks & annunciators & electric horns, The Jones Speedometer, Broadway & 76th Sts., N. Y. City.
- JONES—gas & gasoline stationary engines, Huntsville Foundry & Machine Works, Huntsville, Ala.
- JONES—steel, brass, bronze or bell metal balls, Jones Ball Co., Arlington Heights, Mass.
- JONES—taximeters, Jones Taximeter Co., Speedometer Bldg., Broadway & 76th St., N. Y. City.
- JONES—wheels, Phineas Jones & Co., 301-311 Market St., Newark, N. J.
- JONES LIVE-MAP—meters & maps, Jones Live-Map Meter Co., 76th St. & Broadway, N. Y. City.
- JONZ—gasoline automobile motors & clutches, Jonz Automobile Co., Beatrice, Neb.
- JORDAN—removable rims, R. W. Jordan, 28 Belvidere St., Boston, Mass.
- JORN—sand blast machines, A. Jorn, Jr., Waukegan, Ill.
- JOVE—dry ignition batteries, J. H. Bunnell & Co., 20 Park Place, N. Y. City.
- JOYCE—tire bolts & lugs, Joyce Air Cushion Tire Bolt Co., 52-54 W. 67th St., N. Y. City.
- JUMBO—hand cleansing compound, Kielgass-Lehman Co., 208 W. Kinzie St., Chicago, Ill.
- JUNIOR—tool kits, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- JUNIOR—wrenches, Frank Mossberg Co., Attleboro, Mass.
- JUSTICE—power hammers, Philip S. Justice & Co., 421 Chestnut St., Phila., Pa.

## K

- K-B—die filing & metal saving machines, The Grant Mfg. & Machine Co., 90 Stillman Ave., Bridgeport, Conn.
- K-B—universal joints, The Kinsler-Bennett Co., 62 Market St., Hartford, Conn.
- K. C.—storage batteries, Kitsee Battery Co., Wilkes Barre, Pa.
- K. C. JUNIOR—stationary engines, gas & gasoline, Kansas City Hay Press Co., Kansas City, Mo.
- \*K. & D.—dynamos, Kendrick & Davis, Lebanon, N. H.
- K. D. M. SYSTEM—marine knock down motors, Knock Down Motor Co. of America, 150 Broadway, N. Y. City.
- K. F. & D.—motorists, caps, Kaplan, Frank & Dunn, 56 E. 13th St., N. Y. City.
- K. H.—auto wheels, K. H. Wheel Co., 1208-50 Military Ave., Detroit, Mich.
- K. & J.—dust & mud shields, Kilbourne & Jacobs Mfg. Co., Congress & Lincoln Sts., Columbus, Ohio.
- K. K.—seamless tubing & ignition cable, Benedict & Burnham Mfg. Co., Waterbury, Conn.
- K-L BRAND—pumice stone, Kielgass-Lehman Co., 208 W. Kinzie St., Chicago, Ill.
- K. & R.—cycle engines & 2 speed motorcycle gears, The Keller & Risque Motor Co., 20 W. 3rd St., St. Paul, Minn.
- \*K. T.—clocks, The K & T Mfg. Co., 32 Atlantic Ave., Boston, Mass.
- K & W—reliners for protecting tires, K & W Mfg. Co., 25 Orange St., Ashland, Ohio.
- K-W—gasoline motor boats, Kershaw-Williams Co., 29-33 Haverhill St., Boston, Mass.
- K-W—magnetos, spark plugs, master vibrators, lamp adapters, electric auto & boat lamps & coils, The K-W Ignition Co., 40 Power Ave., Cleveland, Ohio.
- K-W SPECIAL—marine gasoline motors, Kershaw-Williams Co., 29-33 Haverhill St., Boston, Mass.
- KACH KLIPX—pedal catcher, Persons Mfg. Co., 54-68 Bloomingdale Road, Worcester, Mass.
- KALAMAZOO—carburetors, Kalamazoo Carburetor Co., Kalamazoo, Mich.

- KALAMAZOO—friction clutches, Burt Mfg. Co., Clinton & Fulford St., Kalamazoo, Mich.
- KALAMAZOO—stools & chairs, Kalamazoo Steel Goods Co., Kalamazoo, Mich.
- KALUX—steel hardening & tempering solution for increasing the efficiency of all carbon steel tools, Metal Hardening Solution Co., Rochester, N. Y.
- KAMLEE—trunks, The Kamlee Co., 339 Milwaukee St., Milwaukee, Wis.
- KAMP KOOKS KIT—cooking outfits, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.
- KANGAROO—spark plugs, The Tritt Electric Co., Union City, Ind.
- KANSAS—glass wind shields, Pioneer Auto Top & Supply Co., 1721 Baltimore Ave., Kansas City, Mo.
- \*KANter'S—grease, The R. J. Kanter Co., 647 Water St., N. Y. City.
- KANTLEEK—inner tubes, Seamless Rubber Co., New Haven, Conn.
- KANT-SKIDS—anti-skid devices, Leather Tire Goods Co., Niagara Falls, N. Y.
- KANT-STIK—fuel level indicators, auto & marine, National Motor Supply Co., Cleveland, O.
- KANTRYP—gauntlets, Ellsworth & Thayer Mfg. Co., Milwaukee, Wis.
- \*KARBEL—automobile covers, American Karbel Co., Jonesboro, Ark.
- KART-TANK—gasoline & oil storage outfits, Auto Trading & Repair Co., 1515 Prospect Ave., Cleveland, O.
- KASTION—brazing compounds, Arthur L. Taber, Corona, Cal.
- KAUFMAN BOTTOMLESS—Bunsen burners & automatic shut-offs, A. G. Kaufman Mfg. Co., Inc., 131-133 Reade St., N. Y. City.
- KAUFMAN—lighting plants & brazing & soldering torches, The A. G. Kaufman Mfg. Co., Inc., 131-133 Reade St., N. Y. City.
- KEARNEY & FOOT—files & rasps, Nicholson File Co., Providence, R. I.
- KEELER—robe rails, foot rests, bolts, nuts, screws, bow rests, bow separators, bow sockets, top fixtures, tire holders, lamp brackets, name plates, monograms, etc., Keeler Brass Co., Grand Rapids, Mich.
- KEELER—storage ignition batteries, Keeler Battery Co., 134 Ontario St., Toledo, O.
- KEEN-EDGE—oil stones, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.
- KEEPDRY—waterproof material for wrapping tires, or other articles, Union Paper & Twine Co., 45 Larnard St., W., Detroit, Mich.
- \*KELLO—wire belting, A. F. Kelley, Providence, R. I.
- KELLOGG 5—tire pumps, Kellogg Mfg. Co., E. Main & Circle Sts., Rochester, N. Y.
- KELLOGG—mechanical tire inflators & tire pressure registers, Kellogg Mfg. Co., E. Main & Circle Sts., Rochester, N. Y.
- KELLS—automobile tanks & radiators, W. J. Kells Mfg. Co., 726-28 11th Ave., N. Y. City.
- KELLY—bicycle handle bars & burners for steam automobiles, Kelley Handle Bar Co., 5017 Perkins Ave., Cleveland, Ohio.
- KELLY—carburetors, John Kelly, Congress St. & 46th Ave., Chicago, Ill.
- KELLY—tire wrenches, John Kelly, Congress St. & 46th Ave., Chicago, Ill.
- KELLY-SPRINGFIELD—solid automobile tires, Consolidated Rubber Tire Co., 20 Vesey St., N. Y. City.
- KELS-CASTILE—hand soap, Monahan Antiseptic Co., 100 Market St., Chicago, Ill.
- KEMIZITE—puncture closing compound, Auto Tire Security Co., 1229 Michigan Ave., Chicago, Ill.
- KEMP—carburetors, J. P. Kemp, 1618 Ruskin Ave., Baltimore, Md.
- KEMPSHALL—automobile tires & tire patches, imported by Cryder & Co., 583 Park Ave., N. Y. City.
- KEMPSMITH—machinery & tools, Kempsmith Mfg. Co., Milwaukee, Wis.
- KENNEBEC—gasoline marine motors, Torrey Roller Bushing Works, Bath, Me.
- KENNEDY IDEAL—carburetors, The Kennedy (Ideal) Carburetor Co., 179 Clarendon St., Boston, Mass.
- KENNEY—automobile jacks, Kenney Mfg. Co., New London, Conn.
- KENO—pump nipples & pump connections, Stevens & Co., 375 Broadway, N. Y. City.
- KENT—voltmeters, ammeters, volt-ammeters & timers, Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa.
- KENYON—automobile tops, R. L. Kenyon Co., Waukesha, Wis.
- KENYON—clothing, motorists', C. Kenyon Co., 23 Union Sq., N. Y. City.
- KEOYAMA—oil, W. Sheppard, 141 E. 25th St., N. Y. City.
- KERATOL—leather for trimming, The Keratol Co., Cor. South & Van Buren Sts., Newark, N. J.
- KETOS—oil hardening steels & drill rods, Halcomb Steel Co., Syracuse, N. Y.
- KEWANEE—unions, ells & tees, National Tube Co., Frick Bldg., Pittsburg, Pa.
- KEYSTONE—chemical fire engines for garages, James Boyd & Bro., 22nd St. bet. Vine & Race Sts., Phila., Pa.
- KEYSTONE—crucible steel castings, Keystone Steel Castings Co., Chester, Pa.
- KEYSTONE—copper polish, McKenna Bros. Brass Co., First Ave. & Ross St., Pittsburg, Pa.
- KEYSTONE—grease & oil, Keystone Lubricating Co., 20th & Allegheny Ave., Phila., Pa.
- KEYSTONE—leather, Atlantic Leather Co., Wright St. & Ave. A, Newark, N. J.
- KEYSTONE—lock washers, Positive Lock Washer Co., Newark, N. J.
- KEYSTONE—oils, oil soap & waste, Keystone Oil & Supply Co., Inc., Pittsburg, Pa.
- KEYSTONE—pipe cutting tools, Hollands Mfg. Co., Erie, Pa.
- KEYSTONE—tire holders, C. F. Rump & Sons, 5th & Cherry Sts., Phila., Pa.
- KEYSTONE—wrenches, drills, drilling posts, nail & center punches, boring & threading tool holders, Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y.
- KEYSTONE IRON CEMENT—metal cement, Pennsylvania Black Filler & Paint Co., Williamsport, Pa.
- KIDD BROS. & BURGHER—nickel steel, Kidd Bros. & Burgher Steel Wire Co., Alliquippa, Pa.
- KIDD SPECIAL WHITE LABEL—drill rod, Kidd Bros. & Burgher Steel Wire Co., Alliquippa, Pa.
- KIEFLER—cycle motors, Kiefler Motor Works, 184 Broadway, Buffalo, N. Y.
- KILBOURNE—storage ignition batteries, Kilbourne & Clark Co., 307 First Ave., S., Seattle, Wash.
- KILCO—carbon removers, Carbon Remover Co., 108 Fulton St., N. Y. City.
- KILFIRE—fire extinguishers, Fyrcide Mfg. Co., 34 Murray St., N. Y. City.
- KILFYRE—fire extinguishers, Kilfyre, Inc., 247-249 Pearl St., N. Y. City.
- KILGORE—pneumatic shock eliminators, Kilgore Mfg. Co., 585 Boylston St., Boston, Mass.
- KILROY—piston rings, The Kilroy Piston Ring Co., 74 Cortlandt St., N. Y. City.
- KIMBALL—wind shields, C. P. Kimball & Co., 315-317 Michigan Ave., Chicago, Ill.
- KINDER—tire cases, Hopewell Bros., 29 Chapel St., Newton, Mass.
- KING—anti-skid devices & leather auto tires, King Leather Tire Co., 3417-3419 Vliet St., Milwaukee, Wis.
- KING—automobile tops, covers & wind shields, King Top Mfg. Co., Main & First Sts., Dayton, O.
- KING—ignition batteries, Vita Mfg. Co., 1151-57 Stanford Ave., Los Angeles, Cal.
- \*KING—paints & colors, Chicago White Lead & Oil Co., Green & Fulton Sts., Chicago, Ill.

**KING KORE KOMPOUND**—core compounds, cupolas, foundry riddles & sieves & plum-bago, Frederic B. Stevens, Detroit, Mich.

**KING OF FIRE KILLERS**—fire extinguishers, Frycide Mfg. Co., 34 Murray St., N. Y. City.

**THE KING POWDER**—metal polish, Cleaner Mfg. Co., 2842 Olive St., St. Louis, Mo.

**KING'S**—auto tire trunks, W. A. King, 52 Public Square, Cleveland, Ohio.

**KINGSLEY**—wind shields, The Novelty Mfg. Co., Maple St., Waterbury, Conn.

**KINGSTON**—carburetors & exhaust mufflers, Byrne, Kingston & Co., Kokomo, Ind.

**KINGSTON**—sparking coils, plugs, timers, magnetos & switches, Kokomo Electric Co., Kokomo, Ind.

**KINWOOD**—automobile parts, Kinsey Mfg. Co., Toledo, Ohio.

**KIPLING'S GRADOMETER**—grade meters, Samuel Buckley & Co., 225 Fifth Ave., N. Y. City.

**\*KIRKHAM**—gasoline automobile motors, The Kirkham Motor Mfg. Co., Bath, N. Y.

**KIRKWOOD**—oil & natural gas burners, Tate Jones & Co., Inc., 806 Empire Bldg., Pittsburg, Pa.

**KISMET**—varnishes, Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y.

**THE KIT**—screw drivers, The Cassady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.

**KLAXON**—automobile horns, Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J.

**KLENO**—hand soap, Kleno Mfg. Co., Inc., N. Weymouth, Mass.

**KLENZOLA**—hand cleansing compound, The Klenzola Co., 1300 Peach St., Erie, Pa.

**KLINES**—lathes & wood working machines, Alpena Industrial Works, Alpena, Mich.

**\*KLINGERIT**—packing (steam), Crane Co., 1214 S. Canal St., Chicago, Ill.

**KLIP**—inspection lamps, Rollman Mfg. Co., Mount Joy, Pa.

**KNEAD IT**—tire cements, M. & M. Mfg. Co., Akron, O.

**KNEELAND**—stationary gasoline motors, Kneeland Mfg. Co., Lansing, Mich.

**KNIGHT**—milling & drilling machines, W. B. Knight Machinery Co., 2019 Lucas Ave., St. Louis, Mo.

**KNIGHT**—pliers, Knights Combination Tool Co., 257-63 George St., New Haven, Conn.

**\*KNIGHT**—tire protectors & tire bands, Detroit Leather Works, 844 Woodward Ave., Detroit, Mich.

**\*KNIGHT**—wind shields, F. H. Knight, 1219-1221 Michigan Ave., Chicago, Ill.

**KNIFE**—automobile ball bearings, Presse Steel Mfg. Co., 454 The Bourse, Phila., Pa.

**KNO-FREEZE-METER**—radiator solution meter, C. J. Tagliabue Mfg. Co., 53 Fulton St., N. Y. City.

**\*KNO-SLIP**—clutch compound, Chas. A. Brophy, Station A, Hinsdale, Ill.

**KNOX**—gasoline marine motors, motor boats, carburetors, propellers & stationary engines, Camden Anchor-Rockland Machine Co., Camden, Me.

**KNOX-ALL**—axle oils, McLean-Brandon Oil & Supply Co., 65 Long Wharf, Boston, Mass.

**KOEHLER'S NEVERBREAK**—cantilever springs, Universal Auto Spring Co., 5500 Florissant Ave., St. Louis, Mo.

**KOEHLER'S UNIVERSAL**—body springs, Universal Auto Spring Co., 5500 Florissant Ave., St. Louis, Mo.

**KOEN'S**—folding chairs, Buffalo General Mfg. Co., 1239 Niagara St., Buffalo, N. Y.

**KOHL SPECIAL**—wind shields, Kohl Mfg. Co., 10th & Canal Sts., Indianapolis, Ind.

**\*KOKOMO**—grease guns, Kokomo Grease Gun Co., P. O. Box 134, Kokomo, Ind.

**KOKOMO**—motorcycle tires, Kokomo Rubber Co., Kokomo, Ind.

**KOONSHINE**—wood & metal polishes, St. Louis Surfer & Paint Co., St. Louis, Mo.

**KOSMOS**—taximeters, General Taximeter Co., 8th Ave. & 49th St., N. Y. City.

**KOVEN**—tanks, exhaust mufflers for marine engines & gasoline storage outfits, L. O. Koven & Brother, 50 Cliff St., N. Y. City.

**KRAEMER**—auto compass, U. S. Auto Compass Co., 411 Grand Ave., Milwaukee, Wis.

**KRAFTWRAP**—paper for wrapping tires, Union Paper & Twine Co., 45 Larnard St., W., Detroit, Mich.

**KRAHN**—lubricators, wind shields & hose couplings, Krahn Mfg. Co., Milwaukee, Wis.

**KRAKNO**—paint fillers, Johnston Paint Co., 226 Main St., Cincinnati, O.

**KRAMER**—fuel strainers, William J. Kramer, 246 Van Alst Ave., L. I. City, N. Y.

**\*KRAUSE**—carburetors, R. E. Krause, 1358 Giddings Road, Cleveland, Ohio.

**KREBS**—carburetors, imported by Panhard & Levassor, Broadway & 62nd St., N. Y. City.

**KREMLO**—ignition batteries, The Hall Storage Battery Co., 1056-60 St. Clair Ave., N. E., Cleveland, O.

**KRICE**—carburetors, Krice Carburetor Co., Detroit, Mich.

**KRIEGER'S**—tool holders, lathe brackets, drill press, turret & lathe bars, cutters, thread chasers, roughing tools, grinding quills & boring bars, Krieger Tool & Mfg. Co., 564-72 W. Randolph St., Chicago, Ill.

**KROESCHELL-SCHWARTZ**—metal melting furnaces, Kroeschell Bros. Co., 414 W. Erie St., Chicago, Ill.

**KROH**—automobile leather trimmings, tops & storm aprons, C. Z. Kroh Mfg. Co., 1212-1214 Jackson St., Toledo, Ohio.

**KROME**—fan & radiator belts, Chicago Rawhide Mfg. Co., 348-50 Ohio St., Chicago, Ill.

**KRUPF**—steel castings, forgings, pressed steel frames, automobile parts, axles, crank shafts, gears, gear blanks & steel, Thos. Prosser & Son, P. O. Box 878, G. P. O., N. Y. City.

**KRYSTAL SOILOFF**—hand soap, The R. M. Hollingshead Co., Camden, N. J.

**KUNDTZ**—automobile wooden dashes, automobile tops & steering wheel rims, Theodore Kundtz, Cleveland, Ohio.

**KURTZ**—magnetos, The Hercules Electric Co., 2128-2136 Northwestern Ave., Indianapolis, Ind.

**KYMOI**—packing, Crandall Packing Co., Palmyra, N. Y.

## L

**L-A**—ignition batteries, Vita Mfg. Co., 1151-57 Stanford Ave., Los Angeles, Cal.

**L. B.**—manganese bronze, Lumen Bearing Co., Buffalo, N. Y.

**L-B**—spark plugs, coils, battery connections, ignition batteries, Lemke-Brgs Electric Co., 9-10-11 Miller Bldg., Milwaukee, Wis.

**\*L & M**—stationary engines, Lammert & Mann, 157-159 Jefferson St., Chicago, Ill.

**L & M**—tire adjusters, tire shoe lifters, looseners & vehicle washers, The Long & Mann Co., 13 Graves St., Rochester, N. Y.

**LXV**—spark plugs, The Automobile Equipment Co., 260 Jefferson Ave., Detroit, Mich.

**LA BUIRE**—auto supplies, imported by La Buire Import Co., 1964 Broadway, N. Y. City.

**LACE WEB**—cushion springs (auto), Trenton Spring Mattress Co., Trenton, N. J.

**LACKAWANNA**—gasoline marine & auto motors, timers, reversing gears for motor boats, boat propellers, stuffing boxes, exhaust & water fittings, electric auto charging apparatus, air compressors & electric light plants, Lackawanna Mfg. Co., Newburgh, N. Y.



- LA COSTE—timers, Lovell, McConnell Mfg. Co., 365 Market St., Newark, N. J.
- LACQUERINE—metal polish, W. H. Cross & Ladd Co., 29 Murray St., N. Y. City.
- LAFITTE—brazing plates, compounds & powders, welding plates & welding & tempering powder, The Phillips Lafitte Co., Phila., Pa.
- LA FRANCE—toilet cases, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- LAKESIDE—wrenches, Lakeside Forge & Wrench Co., Erie, Pa.
- \*LAKE SUPERIOR—wrenches, Lake Superior Wrench Co., 127 Maple St., Sault Ste. Marie, Mich.
- LAMBERT—stationary engines, Lambert Gas & Gasoline Engine Co., Anderson, Ind.
- LANCASTER—bit braces & machine knives, Lancaster Machine & Knife Works, Lancaster, N. Y.
- LONDON—extra tire holders & locking devices, The John S. London Co., 200 N. Main St., Elkhart, Ind.
- LANE—jacks, Lane Bros. Co., Poughkeepsie, N. Y.
- LANG'S—tool holders, planer clamps & bolt heads for planers, G. R. Lang Co., Meadville, Pa.
- LANGS—two speed gears & friction clutches, C. H. Lang, 35 E. Adams St., Chicago, Ill.
- LA PARFAITE—goggles, imported by American Thermo-Ware Co., 16 Warren St., N. Y. City.
- LA PORTE—auto bodies, tops, wind shields & body parts, La Porte Carriage Co., La Porte, Ind.
- LASCO—wind shields, London Auto Supply Co., 2540-48 Wabash Ave., Chicago, Ill.
- LASTIC—muffler paints, Morris Paint Co., 10017 Euclid Ave., Cleveland, Ohio.
- \*LATHERETTE—faucet, The Artell Company, 27 E. 22nd St., N. Y. City.
- LAUSON—stationary engines, The John Lauson Mfg. Co., New Holstein, Wis.
- LAVA—hand soap, Wm. Walthe & Co., East Grand Ave. & 2nd St., St. Louis, Mo.
- LAVA—insulation, American Lava Co., Chattanooga, Tenn.
- LAVIGNE—bits, Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn.
- LAVIGNE—oilers, float valves & oil cups, Lavigne Mfg. Co., Commonwealth Ave. & Railroad, Detroit, Mich.
- LAVOISITE—welding equipment, H. W. Dopp Co., Buffalo, N. Y.
- \*LAWSON—automobile transmission gears & friction clutches, Lawson Mfg. Co., Homestead, Pa.
- LEADER—belting, Thermoid Rubber Co., Trenton, N. J.
- LEADER—ferrules, Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
- LEADER—wind shields, Sprague Umbrella Co., Nowalk, Ohio.
- LEADER—wrenches & hose couplings, Ripley Pipe Wrench Co., Ripley, N. Y.
- LEAK-NO—metallic compound, H. W. Johnson-Manville Co., 100 William St., N. Y. City.
- LEA-SIMPLEX—cold metal saws, Lea Equipment Co., 90 West St., N. Y. City.
- LEA SPEEDISTIMETER—speed indicator with odometer & clock combined, Motor Car Specialty Co., Lamberton & Lalor Sts., Trenton, N. J.
- LEA SPEEDMETER—speed indicator with odometer combined, Motor Car Specialty Co., Lamberton & Lalor Sts., Trenton, N. J.
- LEA—truck wheels, Tractor Engineering Co., Lamberton & Lalor Sts., Trenton, N. J.
- \*LEATHERINE—belt dressing, The "Imperial Leather Preserver" Mfg. Co., 216 Chancellor St., Phila., Pa.
- LEATHERLAC—top dressing, Johnston Paint Co., 226 Main St., Cincinnati, Ohio.
- LEATHEROID—prepared roofing for factories, Union Paper & Twine Co., 45 Larnard St., W., Detroit, Mich.
- LEAVITT—magnesium metal, C. W. Leavitt Co., Cortlandt Bldg., 30 Church St., N. Y. City.
- LEAVITT—timers, secondary distributors & fuel strainers, The Uncas Specialty Co., 21-37 Shipping St., Norwich, Conn.
- \*LEAVITT—wood polishes, Gilbert Leavitt, 11 India St., Boston, Mass.
- LEAVITT SIREN—automobile horns, The Uncas Specialty Co., 21-37 Shipping St., Norwich, Conn.
- LE CHATELIER—pyrometers, Wilson-Maeulen Co., N. Y. City.
- \*LE COMPTE—safety brake lock for Ford Runabouts, Le Compté & Diffenderffer Mfg. Co., 217 N. Calvert St., Baltimore, Md.
- LEE'S GLISTENER—wood polish, Glistener Mfg. Co., 622 Cypress St., Kansas City, Mo.
- LEGNARD—spark plugs, Legnard Bros., 203-205 Genesee St., Waukegan, Ill.
- LEHMAN—heaters, auto, Lehman Bros., 10 Bond St., N. Y. City.
- LEHMAN—timers, spark plugs & distributors, J. H. Lehman Mfg. Co., 500 Fifth Ave., N. Y. City.
- \*LEIGHTON—gasoline marine motors, Herbert J. Leighton, Syracuse, N. Y.
- LEKTRO—universal grinders, portable grinders & drills & circular saws, The Warner-Smith Lektro Products Co., Room 500, Neave Bldg., Cincinnati, Ohio.
- LEMOINE—springs, axles & forgings, imported by International Engineering Co., of N. J., 1779 Broadway, N. Y. City.
- LENNOX—tire inflating tanks & whistle outfits, The Lennox Chemical Co., Cleveland, Ohio.
- LEPAUTE—taximeters, imported by S. Breakstone, 1712 Michigan Ave., Chicago, Ill.
- LESTER—screw machines, Davis Sewing Machine Co., Dayton, Ohio.
- LE VIF—cross chains & hooks, Newhall Chain Forge & Iron Co., 90 West St., N. Y. City.
- LEVO—wood polishes, John T. Stanley, 650 W. 30th St., N. Y. City.
- LEWIS—vises, Prentiss Vise Co., 44 Barclay Co., N. Y. City.
- LIBBY—turret & heavy duty chucking lathes, International Machine Tool Co., W. 21st St. & Belt Ry., Indianapolis, Ind.
- LIBERTY—denatured alcohol, Woolner Distilling Co., Peoria, Ill.
- \*LIBERTY—ignition batteries, C. J. Hirlmann, 17-19 Lighthouse St., N. Y. City.
- LIBERTY—lamps, American Lamp Works, 253 W. 47th St., N. Y. City.
- LIBERTY—marine gasoline motors, Detroit Auto Specialty Co., 909 Greenwood Ave., Detroit, Mich.
- LIFE SAVER—oil tanks, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.
- LIFT UP—curtain fasteners, Carr Fastener Co., 145 High St., Boston, Mass.
- LIGGETT—axles & springs, Liggett Spring & Axle Co., Park Bldg., Pittsburgh, Pa.
- LIGHT—bicycles, The Merkel-Light Motor Co., Pottstown, Pa.
- LIGHTHOUSE—tire protectors & license numbers, Chas. F. Lighthouse, 877 Seventh Ave., N. Y. City.
- LIGHTNING—bolt & nut machinery, pipe cutting & threading machines, reamers, screw plates, taps & dies, Wiley & Russell Mfg. Co., Greenfield, Mass.
- LIGHTNING—cross chain hooks, The Cassidy-Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.
- LIGHTNING—drill presses, milling machines, woodworkers' & machinists' vises, Massey Vise Co., 9-11 W. Michigan St., Chicago, Ill.
- LIGHTNING—hand cleansing compound, F. Kenney Mfg. Co., 360-368 Dorchester Ave., Boston, Mass.
- LIGHTNING—hand punches, American Lock Nut Co., Oregon, Ill.
- LIGHTNING—hose clamps, The Cleveland Pneumatic Tool Co., 6410 Hawthorne Ave., Cleveland, O. (Jobbers.)
- \*LIGHTNING—kerosene & gasoline auto burners, E. C. Walker Mfg. Co., 811 Nelson St., Louisville, Ky.



- LIGHTNING**—stationary engines, Kansas City Hay Press Co., Kansas City, Mo.
- LIGHTNING**—wrenches, William Hjorth & Co., Jamestown, N. Y.
- LIGHTNING FLASH**—metal polish, Lightning Flash Specialty Co., 236 E. 5th St., Cincinnati, Ohio.
- \***LIGHT WEIGHT**—oil cycle lamps, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
- LINCOLN**—milling machines, The Carter & Hakes Machine Co., Winsted, Conn.
- LINCOLN**—variable speed motors for driving machinery, The Reliance Electric & Engineering Co., Caxton Bldg., Cleveland, Ohio.
- LINCOLN**—wind shields, The S. M. Supplies Co., 22-24 Lincoln St., Boston, Mass.
- LIND**—wrenches, Lind Universal Tool Co., 75 Westminster St., Providence, R. I.
- LINDHOLM**—grease cups, J. Stewart Smith, 1779 Broadway, N. Y. City. (Mfr's agt.)
- LINDLEY**—gasoline motor boats, marine engines, fuel strainers, motor boat cushions, awning & spray hoods, canvas covers, W. H. Lindley Co., Main & Canal Sts., Canastota, N. Y.
- LINDURO**—enamels for boats, The Lowe Bros. Co., Dayton, O.
- LIN-O**—soap, auto body, S. Strunz & Son, 705 Bingham St., Pittsburg, Pa.
- LINOBESTOS**—brake lining, Empire Tire Co., Trenton, N. J.
- LINOSOAP**—auto body cleansing compound, Linosoap Co., 942-944 W. 5th St., Cincinnati, Ohio.
- LION**—aluminum castings, The Fairfield Aluminum Foundry Corp., Fairfield, Conn.
- LION**—automobile bodies & tops, Fitzgibbon & Crisp Carriage & Wagon Co., 28-36 Bank St., Trenton, N. J.
- LION**—cotton waste, Hoffman-Corr Mfg. Co., 55-57 White St., N. Y. City.
- LION**—grease cups, The Lunkenheimer Co., Cincinnati, Ohio.
- LIP**—packing, Crandall Packing Co., Palmyra, N. Y.
- LIPMAN**—circulation pumps, Lipman Mfg. Co., 205 Pleasant St., Beloit, Wis.
- \***LIPPINCOTT**—tire inflators, water motors, emery grinders, polishing & buffing machines & lathes, Lippincott Tire Pump Dept., Newark, N. J.
- LIQUID VENEER**—wood polish, Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.
- LIQUID MARBLE**—wood polish, Anderson Varnish Co., 3214 Sheffield Ave., Chicago, Ill.
- LISK**—gasoline marine motors & motor boats, Geo. A. Lisk, 1193-95 Jefferson Ave., W. Detroit, Mich.
- LITTLE BLACKSMITH**—punches & shears, J. F. Kidder Mfg. Co., Burlington, Vt.
- LITTLE BLUE FLAG**—varnish, The Lowe Bros. Co., Dayton, O.
- LITTLE GEM**—gasoline storage outfits, National Oil Pump & Tank Co., 411-413 E. First St., Dayton, Ohio.
- LITTLE GEM**—steam vulcanizers, Kerr-Griffin Vulcanizer Mfg. Co., 5919 Penn Ave., Pittsburg, Pa.
- LITTLE GIANT**—Air compressors, The Orange Machine & Mfg. Co., 10-14 Stetson St., Orange, N. J.
- LITTLE GIANT**—calipers & dividers, countershafts, bolt cutters, nut tappers, milling tools, reamers, taps & dies, drill holders, wrenches & measuring gauges, Wells Bros. Co., Greenfield, Mass.
- LITTLE GIANT**—drill chucks, Westcott Co., Oneida, N. Y.
- LITTLE GIANT**—fire extinguishers, H. H. Salmon & Co., 82 Wall St., N. Y. City.
- \***LITTLE GIANT**—hand punches, Excelsior Tool & Machine Co., E St., St. Louis, Mo.
- LITTLE GIANT**—hand punches & shears, Little Giant Punch & Shear Co., Sparta, Ill.
- \***LITTLE GIANT**—spark plugs, timers & muffler cut-outs, W. H. Herbert, 3312 Wabash Ave., Chicago, Ill.
- LITTLE GIANT**—stationary & marine gasoline engines, Strelinger Marine Engine Co., 171-175 Woodbridge St. W., Detroit, Mich.
- LITTLE GIANT**—steering devices for light cars, Widmer Machine Works, Inc., 292-91 E. 135th St., N. Y. City.
- LITTLE GIANT**—swage blocks, post drills & drill press & foot vises, B. B. Noyes & Co., Greenfield, Mass.
- LITTLE GIANT**—vehicle washers, Ideal Carriage Washer & Automobile Water Saver Co., 383 Main St., E., Rochester, N. Y.
- LITTLE HERCULES**—gasoline storage outfits, National Oil Pump & Tank Co., 411-413 E. First St., Dayton, Ohio.
- LITTLE HUSKY**—chain tool, Motor Car Supply Co., 1451-1455 Michigan Ave., Chicago, Ill.
- LITTLEJOHN'S**—apron fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- \***LITTLE LEVER**—anti-skid chain hooks, Abrams-Mason Co., Chatham, N. Y.
- \***LITTLE STEERSMAN**—safety device, Abrams-Mason Co., Chatham, N. Y.
- \***LITTLE TIGER**—marine gasoline engines, Northwestern Machine Co., 132-134 Larned St., East Detroit, Mich.
- LITTLE WONDER**—vulcanizers, Rice & Dayton Mfg. Co., Cedar Falls, Ia.
- LIVINGSTON**—radiators, Livingston Radiator & Mfg. Co., Inc., 312 W. 52nd St., N. Y. City.
- LLOYD**—gasoline marine motors, 1000 Island Boat & Engine Co., Morristown, N. Y.
- LOBEE**—pumps (circulation & bilge), Lobe Pump & Machinery Co., 140-152 Terrace, Buffalo, N. Y.
- LOBSTER CLAW**—battery connections, The Tregoning Elec. Mfg. Co., Cleveland, Ohio.
- LOCK**—grease cups, The Lunkenheimer Co., Cincinnati, O.
- LOCKPORT**—radiators, hoods & mud guards, Lockport Stamping Co., Race St., Lockport, N. Y.
- LOCKWOOD**—pressure gauges, Industrial Instrument Co., Foxboro, Mass.
- LOCKWOOD**—primers, Carter & Peek, 214 Carter Bldg., Jackson, Mich.
- LOCO**—high speed steels, Atlas Steel Co., Dunkirk, N. Y.
- LOEW VICTOR**—stationary engines & pipe cutting & threading machinery, The Loew Mfg. Co., Cleveland, O.
- LONDON**—automobile tops & drop glass fronts, London Auto Supply Co., 2540-48 Wabash Ave., Chicago, Ill.
- LONG**—radiators, Long Mfg. Co., 1430-34 Michigan Ave., Chicago, Ill.
- LONG DISTANCE**—wind shields, tool boxes, battery cases, magnetos & electric auto horns, The Guarantee Tire & Rubber Co., 208-210 S. Illinois St., Indianapolis, Ind.
- LONG LIFE**—rawhide lace & clutch leather, National Leather Belting Co., 29 Ferry St., N. Y. City.
- LOOKOUT**—burner tips, cycle, American Lava Co., Chattanooga, Tenn.
- LOOKOUT**—glass front cleaners, Lookout Cleaner Mfg. Co., 55 Wabash Ave., Chicago, Ill.
- \***LOOMIS**—carburetors, Loomis Auto Co., Westfield, Mass.
- LORAIN**—marine gasoline engines, National Steel Products Co., Lorain, O.
- LORD**—wrenches, pipe cutting tools & reamers, L. L. Lord Co., Meadville, Pa.
- LORING**—speed gauge, Loring Auto Appliance Co., 42 W. 43rd St., N. Y. City.
- LO-SWING**—lathes, Fitchburg Machine Works, Fitchburg, Mass.
- LOUNSBERY**—button machines, G. H. Lounsbury & Sons, 107-109 W. Third St., Cincinnati, O.
- LOWELL**—linen thread, Jno. C. Meyers & Co., Lowell, Mass.
- LOXIT**—lock switches, Loxit Motor-Lock Co., North Tonawanda, N. Y.
- LOXON**—lamp guards, Crescent Co., Valparaiso, Ind.
- LUBROLEINE**—oil, Fisk Bros. Refining Co., 24 State St., N. Y. City.

- MANVILLE—fire extinguishers, W. H. Johns-Manville Co., 100 William St., N. Y. City.
- LUCAS—colors, top dressing & enamels, John Lucas & Co., Phila., Pa.
- LUCAS—power presses, Lucas Machine Tool Co., Cleveland, Ohio.
- LUCO—lamp brackets, Luce Mfg. Co., Inc., Dalton, Mass.
- LUMEN—bronze, manganese & brass castings, Lumen Bearing Co., Buffalo, N. Y.
- LUMINO—metal polish, F. T. Lord Polish Co., 37 Hovey Ave., Cambridge, Mass.
- \*LUNDGREN—distributors & timers comb. & ignition batteries, Lundgren Mfg. Co., Ridge Ave. & Green St., Phila., Pa.
- LUNKENHEIMER—generator valves, lubricators, grease cups, priming cups, relief valves, pressure regulators, oil & fuel pumps, water gauges, etc., The Lunkenheimer Co., Cincinnati, Ohio.
- LUSTRAL—metal polish, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- \*LUSTRE—metal polishes, Lustre Chemical Co., 1303 Michigan Ave., Chicago, Ill.
- LUSTRE—top dressing & wood polish, Aquilla Chemical Co., 187 Third Ave., Milwaukee, Wis.
- LUTA—burners, Wm. M. Crane Co., 1131-1133 Broadway, N. Y. City.
- LUTZ—storage ignition batteries, The Lutz-Lockwood Mfg. Co., Aldene, N. J.
- LUVERNE—automobile wheels, Luverne Automobile Co., Luverne, Minn.
- LUXURY—auxiliary chairs, Graves & Congdon Co., Carriage Ave., Amesbury, Mass.
- LYCOPART—foundry partings, L. J. Swoboda, 96 Warren St., N. Y. City.
- LYON—lockers, steel racks, boxes, barrels, tables, trucks & tool boxes, Lyon Metallic Mfg. Co., Aurora, Ill.
- M**
- McADAMITE—metal, U. S. McAdamite Metal Co., 18-28 Rapelye St., Brooklyn, N. Y.
- McCABE—lathes, J. J. McCabe, 30 Church St., N. Y. City.
- McCANNA—lubricators & carburetors, McCanna Mfg. Co., 56 N. Jefferson St., Chicago, Ill.
- McCLELLAN—breast drills, Lancaster Machine & Knife Works, Lancaster, N. Y.
- McCLELLAN—files & rasps, Nicholson File Co., Providence, R. I.
- McCORD—lubricators, radiators, radiator fans, carburetors & belting, McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.
- McCROSKY—adjustable reamers & expanding mandrels, The McCrosky Reamer Co., Meadville, Pa.
- \*McFADDEN—gasoline marine motors, McFadden Mfg. Co., Havana, Ill.
- McGREGOR—bumpers, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- McKEAN—lamp brackets, Pendleton Auto Garage, Westfield, Mass.
- McKIM—gaskets, McCord Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.
- McKINNON—automobile dashes, license hangers, mud guards & folding auto seats, McKinnon Dash Co., Amherst St., Buffalo, N. Y.
- McNAULL—automobile tires, The McNaull Auto Tire Co., 228 Cherry St., Toledo, O.
- \*M. A.—gasoline storage tanks, Motor Accessories Co., 43 Cortland St., N. Y. City.
- M. & B.—auto oil & grease, McLean-Brandom Oil & Supply Co., 65 Long Wharf, Boston, Mass.
- M & B—carburetors, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- M & B—speed change gears, frames, axles, transmissions & steering apparatus, imported by Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City.
- M. & B. NOX—ALL—metal polishes, McLean-Brandom Oil & Supply Co., 65 Long Wharf, Boston, Mass.
- M. I. F. CO—pipe fittings, Malleable Iron Fittings Co., Branford, Conn.
- M & M—oils & greases, Miller & McLean, 120 Liberty St., N. Y. City.
- M. & M.—tire repair outfit, M. & M. Mfg. Co., Akron, O.
- M. R. V.—metal melting furnaces, J. B. Wise, Watertown, N. Y.
- M. & S.—magnetos, Mavity-Sleeper Co., Fowler, Ind.
- M. W. M.—gloves, The Gloversville Auto Glove Co., Gloversville, N. Y.
- M. & W.—tires, Morgan & Wright, Foot of Bellevue St., Detroit, Mich.
- MACLACHLAN—steam engines (auto & marine), Detroit Steam Engine Co., 15 Gilman St., Detroit, Mich.
- MACPHAIL—steel foundry flasks, Macphail Flask & Machine Co., Fort Madison, Iowa.
- MADDEN—files, The Whitaker Mfg. Co., 509 W. Monroe St., Chicago, Ill.
- MADISON SQUARE—annunciators, speaking tubes, push button switches, toilet cases, etc., C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- MAGIC—drill chucks, Modern Tool Co., Erie, Pa.
- MAGIC—metal polishes, Charles F. Sweet, Inc., 20 Ford St., Hartford, Conn.
- MAGIC—rubber hose & belting, United & Globe Rubber Mfg. Co., Trenton, N. J.
- MAGIC—soap, The O. F. Zurn Co., Broad & Lehigh Ave., Phila., Pa.
- MAGICLEAN—wood & metal polish, F. A. Schmoeger, Sterling, Ill.
- \*MAGICO—wood polishes, metal polishes & auto body cleansing compounds, Orient Specialty Co., 178 Fulton St., N. Y. City.
- MAGNALIUM—aluminum alloy ignots, sheets, rod, wire & tubing, Morris R. Machol, 16 Beaver St., N. Y. City.
- \*MAGNA QUICK CHANGE—rigid battery holder, R. W. Magna Mfg. Co., Holyoke, Mass.
- MAGNET—marine engines, side cars, imported by Magnet Motor Co., 1400 Michigan Ave., Chicago, Ill.
- MAGNOLIA—bearing metals, Magnolia Metal Co., 113-115 Bank St., N. Y. City.
- MAJESTIC—acetylene auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.
- MAJESTIC—gasoline automobile & marine motors, Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis.
- MAJESTIC—motorcycle stands, belt fasteners & belt drills, cycle spring forks & luggage carriers, Majestic Mfg. Co., Worcester, Mass.
- \*MAJESTIC—wood polishes, The Consolidated Chemical Co., 691-93 W. Fort St., Detroit, Mich.
- \*MAJOR—gasoline marine engines, Strelinger Marine Engine Co., 46 Congress St., E., Detroit, Mich.
- MAJOR JONES—marine motors, spark plugs & stationary engines, Major Jones Motor Co., 74 Sproat St., Detroit, Mich.
- MANCO—foot rests, robe rails, tire holders, lamp brackets, muffler cut-outs & timers, M. A. N. Mfg. Co., 257 W. Exchange St., Providence, R. I.
- MANGIN—mirror & condensing lenses, C. & A. Matisse, 543-549 E. 116th St., New York City.
- MANHATTAN—switches, coils & portable elec. lights, Manhattan Electrical Supply Co., 17 Park Place, N. Y. City.
- MANSFIELD—tires, mats, bumpers, inner tubes, tire cements & patches, Mansfield Rubber Co., Mansfield, O.
- MANTAHALAH—tire talc, North Carolina Talc & Mining Co., Hewitt, N. C.
- MANUFACTURING—key & air chucks, W. L. Abate, 76 W. Lincoln Ave., Mt. Vernon, N. Y.
- MANVILLE—automatic wire & metal forming machines, Manville Bros. Co., Waterbury, Conn.

- \*MANY USE—oil, The Many-Use Oil Co., 113 Chambers St., N. Y. City.
- MANZEL—oilers, Manzel Brothers Co., 315-319 Babcock St., Buffalo, N. Y.
- MAPLE CITY—oil cans, Maple City Mfg. Co., Monmouth, Ill.
- MARBLE-HAYWOOD—vulcanizers, Haywood Tire & Equipment Co., 332 N. Illinois St., Indianapolis, Ind.
- \*MARBLEHEAD—hull coating, Stearns & McKay, Marblehead, Mass.
- MARINE—grease cups, The Lunkenheimer Co., Cincinnati, O.
- MARION—reliners, Brackett & Gorham, Marion, O.
- MARK—gasoline marine & auto motors, propellers, reverse gears & boat lighting outfits, Mark Motor Co., 8721 Harkness Rd., Cleveland, O.
- MARKO—ignition batteries & lighting batteries, Marko Storage Battery Co., 102 Jefferson Ave., Brooklyn, N. Y.
- \*MARLES—emergency patch, The Middlesex Co., 1031-32 N. Y. Life Bldg., New York City, N. Y.
- MARS—lubricators, The Lunkenheimer Co., Cincinnati, O.
- MARS—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- MARSH—steam air pumps, American Steam Pump Co., Battle Creek, Mich.
- MARTEN—fire extinguishers, The Tea Tray Co. of Newark, Mulberry & Murray Sts., Newark, N. J.
- MARTIN—fuel strainers, The Turner Brass Works, Sycamore, Ill.
- MARVEL—cycle motors & frames, Marvel Motorcycle Co., Hammondsport, N. Y.
- MARVEL—carburetors & gasoline strainers, Marvel Carburetor Co., 15½ Virginia St., Indianapolis, Ind.
- MARVEL—hack saws, portable grinders, punches & shears, Armstrong-Blum Mfg. Co., 339-57 N. Francisco Ave., Chicago, Ill.
- MARVEL—metal polish, Rex Chemical Co., 104 S. Howard St., Baltimore, Md.
- MARVEL—storage batteries, The Excelsior Storage Battery Co., 14 E. 116th St., N. Y. City.
- MASCO—ignition storage batteries, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.
- MASCOT—babbitt metal, Light Mfg. & Foundry Co., Union & Queen Sts., Pottstown, Pa.
- MASCOT—cycle handle bar grips & enameling ovens, American Enamel Co., Providence, R. I.
- MASCOT—cycle & motorcycle handle bar grips & enameling ovens, American Enamel Co., Providence, R. I.
- MASCOT—gasoline stationary engines, Jacobson Machine Mfg. Co., Warren, Pa.
- MASCOT—polishing compounds, Bennett-O'Connell-Stevens Co., 97-101 Clinton St., Chicago, Ill.
- MASON—battery connections & battery holders, The Sumter Telephone Mfg. Co., Sumter, S. C.
- MASON—gasoline marine engines, Wm. H. Mason, Mt. Carmel, Ill.
- MASTER WORKMAN—stationary gasoline engines, The Temple Pump Co., 17-27 W. 15th St., Chicago, Ill.
- MATCHLESS—cigar lighters & portable electric lights, The Match-Less Light Co., Caxton Bldg., Cleveland, O.
- MATCHLESS—gears, pinions & racks, Philadelphia Gear Works, 1120-22 Vine St., Phila., Pa.
- MATHISON—gasoline motor boats, Mathison Boat Co., River & Bowen Sts., Oshkosh, Wis.
- MATISSE—lamp lenses, condensing, C. & A. Matisse, 543-549 E. 116th St., N. Y. City.
- MATS—wood polish & leather dressing, Weiss Polish Works, 714 S. Marshfield Ave., Chicago, Ill.
- MATTHEWS—motor boats, The Matthews Boat Co., Port Clinton, O.
- MATTOON'S—hand soaps & powders, Mattoon Mfg. Co., 120 Allyn St., Hartford, Conn.
- MATTSON—sponge rubber motorcycle grips, Lodi, N. J.
- MAXIM—tire inflators, F. A. Law Machine Co., 41 Wells St., Hartford, Conn.
- MAXIMUM—driving chains, auto, Link-Bell Co., Hunting Park Ave. & Reading Ry., Nicetown, Phila., Pa.
- MAXIMUS—carburetors, timers & auto lamps, Beckley Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- MAXWELL—seats, auto, The Fellwock Automobile & Mfg. Co., Evansville, Ind.
- MAYDOLE—hand hammers, The David Maydole Hammer Co., Norwich, N. Y.
- MAYER—carburetors, Mayer Carburetor Co., 2673 Main St., Buffalo, N. Y.
- MAYHEW—hand punches, H. H. Mayhew Co., Shelburne Falls, Mass.
- MAYO—radiators, hoods, mud guards, tanks & sheet metal articles, The Mayo Radiator Co., State & Mill River Sts., New Haven, Conn.
- MAYO—tires, James Mayo, 222 Penn St., Reading, Pa.
- MEA—magnetos, imported by Theo. H. Marburg, Room 12, 59 Wall St., N. Y. City.
- MEADE—pipe vises, L. L. Lord Co., Meadville, Pa.
- \*MECCO—gasoline marine motors, Mechanical Electrical Construction Co., 1609-11 Camac St., Phila., Pa.
- MECHANICS—multiple spindle drills, Mechanic's Machine Co., Rockford, Ill.
- MECHANICS HALL—annunciators, speaking tubes, push button switches, toilet cases & bouquet holders, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- \*MEG—oil cans, Gem Mfg. Co., Pittsburg, Pa.
- MEMCO—grease cups, Mechanical & Electrical Mfg. Co., rear 2227 Prairie ave., Chicago, Ill.
- MENDENHALL—road maps & guides, C. S. Mendenhall, 512 Race St. Cincinnati, Ohio.
- MENNS—carburetors, Derry Mfg. Co., Derry, N. H.
- MENOMINEE—dynamos, Menominee Electric Mfg. Co., Menominee, Mich.
- MEPHISTO—auger bits & bit braces, W. A. Ives Mfg. Co., Wallingford, Conn.
- MEPHISTO—spark plugs, Mica Core Mfg. Co., 442 E. 166th St., N. Y. City.
- MERCEDES—oil, Charles F. Sweet, Inc., 20 Ford St., Hartford, Conn.
- MERIDEN—lathes, The Meriden Machine Tool Co., Meriden, Conn.
- MERITAS—water-proof covering materials & upholstery goods, Standard Oil Cloth Co., 320 Broadway, N. Y. City.
- MERKEL—cycle motors, Merkel-Light Motor Co., Pottstown, Pa.
- MERMAID—leather belting, Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.
- MERRELL—pipe threading & cutting machines, The Merrell Mfg. Co., Toledo, O.
- MERRITT—shock absorbers, F. W. Merritt, Room 211, 1777 Broadway, N. Y. City.
- MESCO—sparking coils, Manhattan Electrical Supply Co., 17 Park Place, New York City, N. Y.
- MESINGER—bicycle saddles, tire repair bands, shock absorbing, saddle attachment & rebound check springs for autos, H. & F. Mesinger Mfg. Co., 1801-03 First Ave.,
- \*METAL-BRITE—metal polish, Leader Mfg. Co., 1808 Chestnut St., St. Louis, Mo.
- \*MET-AL-INE—metal polish, The Victor Mfg. Co., 72 Chestnut St., Newark, N. J.
- METALLIC PHOSPHORO—aluminized zinc, The New Era Mfg. Co., Kalamazoo, Mich.
- METCALF—emery wheel dressers, Heald Machine Co., Worcester, Mass.
- METEOR—spark plugs, Auto Specialties Mfg. Co., 656-658 3rd St., Milwaukee, Wis.
- METEOR—oil auto maps, C. T. Ham Mfg. Co., Rochester, N. Y.
- METEOR—tires, blowout patches & tire accessories, Shawmut Tire Co., 97 Bedford St., Boston, Mass.
- METEOR—wire for sparking points, Herman Boker & Co., 101 Duane St., New York City.

- METROPOLITAN—colors, John Lucas & Co., Phila., Pa.
- MEXOLINE—metal polish, Matchless Metal Polish Co., N. Y. City.
- MEXOLINE—metal polishes, McKenna Bros. Brass Co., First Ave. & Ross St., Pittsburgh, Pa.
- MEYER EXPANSION—reamers, Meyer Reamer Co., 1539 Buhler Ave., Cleveland, O.
- MEYER HUB SEWING THREAD, MEYER DIAMOND SPOOL SILK, MEYER NEVER RIP TUFTING TWINE, MEYER SPOOL COTTON & LOWELL LINEN THREAD, Jno. C. Meyer & Co., Lowell, Mass.
- MEZGER AUTOMATIC—wind shields, C. A. Mezger, Inc., 239 W. 56th St., N. Y. City.
- MIAMI—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.
- MIAMI—stationary engines, The Middletown Machine Co., Middletown, Ohio.
- MIAMI VALLEY—lathes, sensitive drills & tail stock turrets, Miami Valley Machine Tool Co., Dayton, Ohio.
- MIANUS—gasoline marine motors & gasoline hoists, Mianus Motor Works, Mianus, Conn.
- MICABOND—mica, Chicago Mica Co., Valparaiso, Ind.
- MICALINE—grease, The New York Mica & Mfg. Co., 122 Clark St., Auburn, N. Y.
- MICASMITHS—mica cores, plates, bushings, segments, tubes, rings, washers, cut and uncut mica, etc., Mica Mfg. Co., 307 W. Broadway, N. Y. City.
- MICHELIN—tires, rims, tire irons, cements, tire repair articles, tire sleeves, tire tools, tire valves, tire pressure registers, tire kits, tire mastics & tire bolts, Michelin Tire Co., Milltown, N. J.
- MICHIGAN—gasoline automobile motors & automobile transmission gears, Michigan Automobile Co., Ltd., Kalamazoo, Mich.
- MICHIGAN—ignition & vehicle batteries, lighting batteries & recharging boards, Knop Battery Co., 69 Atwater St. E., Detroit, Mich.
- MICHIGAN—stationary gas & gasoline engines, National Engineering Co., Saginaw, Mich.
- MICHIGAN—transmission gears for motor boats, Michigan Wheel Co., Canal & Le Grande Sts., Grand Rapids, Mich.
- MIDGET—ignition batteries & ignition battery rechargers, Geisler Bros. Storage Battery Co., 514-516 W. 57th St., N. Y. City.
- MIETZ—kerosene marine motors, electric charging apparatus, air compressors & friction clutches for boats, Aug. Mietz, 128-138 Mott St., N. Y. City.
- MILBRADT—wind shields, Milbradt Mfg. Co., 1436-42 N. 8th St., St. Louis, Mo.
- MILFORD—hack saw blades, Henry G. Thompson & Son Co., New Haven, Conn.
- MILFORD—leather automobile clothing, Milford Shoe Co., Milford, Mass.
- MILLER—ratchet tools, Walworth Mfg. Co., 128 Federal St., Boston, Mass.
- \*MILLER—saw trimmers, Miller Saw-Trimmer Co., Milwaukee, Wis.
- \*MILLER—shock absorbers & coil springs, Surprise Distributing Co., 1931 Broadway, N. Y. City.
- MILLER—spark plugs & jacks, Chas. E. Miller, 97-101 Reade St., N. Y. City.
- MILLER—wind shields, Bridgeport Vehicle Co., South Ave. & Water St., Bridgeport, Conn.
- MILLERS FALLS—tool holders & breast drills, Millers Falls Co., 28 Warren St., N. Y. City.
- MILL'S—battery connections, Stackpole Battery Co., St. Marys, Pa.
- MILLS—dry core compounds, H. E. Mills Mfg. Co., Syracuse, N. Y.
- MILWAUKEE—files & rasps, F. Westfahl & Co., Milwaukee, Wis.
- MILWAUKEE—milling machines & cutters, Kearney & Trecker, Milwaukee, Wis.
- MILWAUKEE—shapers & tool grinders, Lutter & Gies, 258 Lake St., Milwaukee, Wis.
- MILWAUKEE—timers, spark plugs & carburetors, Milwaukee Auto Engine & Supply Co., 706-708 Winnebago St., Milwaukee, Wis.
- MIN-CARB—oils & greases, Royal Lubricating Oil Co., 116 Broad St., N. Y. City.
- MINERVA G & A—carburetors, imported by Geo. V. Lyons Motor Co., 2332-84 Broadway, N. Y. City.
- MINGST—tool holders, boring, cutting off & turning tools, C. P. Mingst, 1230 Riverside Ave., Evansville, Ind.
- MINNIE DUPREE—auto veil, Boehm & Levine, 561-563 Broadway, N. Y. City.
- MINUTE—tire adjusters, The Long & Mann Co., 13 Graves St., Rochester, N. Y.
- MIONE—hand soap, The Mione Mfg. Co., Hartford, Conn.
- MIROSCOPE—mirrors, J. Alexander Co., 1931 Broadway, N. Y. City.
- MISSOURI—gasoline marine motors, H. Lipfert, 2810 N. 11th St., St. Louis, Mo.
- MITCHELL—fire extinguishers, Badger Chemical Mfg. Co., 143 Reed St., Milwaukee, Wis.
- MITE—grease cups, The Lunkenheimer Co., Cincinnati, Ohio.
- MOBILENE—gaskets, H. W. Johns-Manville Co., 100 William St., N. Y. City.
- MOBILIL—automobile oil, Vacuum Oil Co., Rochester, N. Y.
- MOBILUBRICANT—cup grease, Vacuum Oil Co., Rochester, N. Y.
- MOBO—auto body cleansing compounds, John T. Stanley, 650 W. 30th St., New York City, N. Y.
- MOCKING-BIRD—auto whistles, The Lunkenheimer Co., Cincinnati, O.
- MOCO—oils, Marshall Oil Co., Marshalltown, Ia.
- MODEL—gasoline automobile motors, Model Gas Engine Works, Peru, Ind.
- MODEL—tire holders, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- MODEL—wind shields, Model Iron & Wire Works, 32nd & Vliet Sts., Milwaukee, Wis.
- MODERN—tapping attachments, Modern Tool Co., Erie, Pa.
- MODERN—wind shields, tops & upholstery covers, Modern Autop & Equipment Co., 607 St. Claire Ave., N. E. Cleveland, O.
- MODOC—auto oils, greases & metal polishes, The Modoc Co., Fernwood, Pa.
- MOGUL—die castings & nickel babbitt, Mogul Metal Co., 149-151 Larned St., Detroit, Mich.
- MOGUL—gaskets, H. W. Johns-Manville Co., 100 William St., N. Y. City.
- MOHAWK—grinding paste, Mohawk Grinding Paste Mfg. Co., Box 608, Schenectady, N. Y.
- MOLINE—spark plugs, Moline Pump Co., Moline, Ill.
- MONACA—drill rods, Pittsburgh Tool Steel Wire Co., Monaca, Pa.
- MONARCH—automobile oils, Tiona Refining Co., Indianapolis, Ind.
- MONARCH—bicycles, The Pope Mfg. Co., Hartford, Conn.
- MONARCH—crusher & pulverizer, O. J. Mousette Co., Inc., Driggs Ave. & N. 10th St., Brooklyn, N. Y.
- MONARCH—drilling machines & ratchet drills, Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y.
- MONARCH—extra tire holders, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- MONARCH—ferrules, Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
- MONARCH—furnaces & core ovens, The Monarch Engineering & Mfg. Co., 1200-06 American Bldg., Baltimore, Md.
- MONARCH—gasoline auto & marine engines & engines for lighting outfits, Monarch Motor Mfg. Co., 3145 N. Halsted St., Chicago, Ill.
- MONARCH—gasoline marine engines, Grand Rapids Gas Engine & Yacht Co., Grand Rapids, Mich.

- MONARCH—hardware, auto, curtain fasteners, storm aprons & top dust hoods, The Enterprise Brass & Plating Co., Cincinnati, O.
- MONARCH—lace leather & fan pump & oiler belts, The Bradford Belting Co., Cincinnati, Ohio.
- \*MONARCH—metal polishes, The Consolidated Chemical Co., 691-93 W. Fort St., Detroit, Mich.
- MONARCH—pneumatic tools, hammers & drills, Standard Railway Equipment Co., St. Louis, Mo.
- MONARCH—rope, steel wire, Macomber & Whyte Rope Co., 507-509 S. Clinton St., Chicago, Ill.
- MONARCH—screw drivers, H. H. Mayhew Co., Shelburne Falls, Mass.
- MONARCH—screw drivers, John Stortz & Son, 210 Vine St., Phila., Pa.
- MONARCH—shock absorbers, Wellington P. Kidder, 40-46 Station St., Brookline, Mass.
- MONARCH—spark plugs, E. M. Benford, Mt. Vernon, N. Y.
- MONARCH—tire holders, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- MONARCH—vises, Prentiss Vise Co., 44 Barclay St., N. Y. City.
- MONARCH—weldless chains, Bridgeport Chain Co., Bridgeport, Conn.
- MON BIJOU—combination scarf & hood with veil, Boehm & Levine, 561-563 Broadway, N. Y. City.
- MONCRIEFF—gauge glasses, imported by H. A. Rogers Co., 19 John St., N. Y. City.
- MONEL METAL—castings, bars, rods, wire & valve stems, The Orford Copper Co., 43 Exchange Place, N. Y. City.
- MONITOR—auto engines, Monitor Automobile Works, 315 Dearborn St., Chicago, Ill.
- MONITOR—distributors, The Waterhouse Co., 6 Pelham St., Boston, Mass.
- MONITOR—oil auto lamps, C. T. Hain Co., Rochester, N. Y.
- MONKEYSHINE—metal polish, Kielgass-Lehman Co., 208 W. Kinzie St., Chicago, Ill.
- MONOGRAM—metal polish, Royal Lubricating Co., 116 Broad St., N. Y. City.
- MONOGRAM—oil, grease, wood polishes & auto body cleaning compounds, Columbia Lubricants Co., of New York, 116 Broad St., N. Y. City.
- MONOPLEX—electric auto horns, Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa.
- MONTBARD-AULNOGE—forgings of pistons, cylinders, axles, etc., imported by Lavallette & Co., Stoddard-Dayton Bldg., N. Y. City.
- MOONEY'S—wood polish, A. J. Mooney, 359-63 Ninth Ave., N. Y. City.
- \*MOORE—gasoline marine motors & timers, Palmer-Moore Co., Talman & Oneida Sts., Syracuse, N. Y.
- MOORE'S—automobile jacks, J. C. Moore & Co., Racine, Wis.
- MORGAN—anti-skid chains, Enterprise Chain Co., Trenton, N. J.
- MORGAN—check valves, B. Morgan, Tew's Court, Old Beach Road, Newport, R. I.
- MORGAN—mixing valves & lubricators, Pioneer Iron Works, Antigo, Wis.
- MORGAN & WRIGHT—motorcycle tires, Morgan & Wright, Foot of Bellevue St., Detroit, Mich.
- MOROCCOLINE—trimming leather, Boston Artificial Leather Co., 310 Fourth Ave., N. Y. City.
- MORRIS—radial drills, The John B. Morris Foundry Co., Cincinnati, Ohio.
- MORRISON—trunks, L. E. Morrison & Co., 27 W. Washington St., Indianapolis, Ind.
- MORROW—drill chucks, Morrow Mfg. Co., Elmira, N. Y.
- MORSE—chains, Morse Chain Co., Ithaca, N. Y.
- MORSE—jacks, J. E. Morse, Springfield, Vt.
- MORSE—plug connectors, cord adjusters & fibre candelabra base sockets, Frank W. Morse, 516 Atlantic Ave., Boston, Mass.
- MORSE EUREKA—terminals, Frank W. Morse, 516 Atlantic Ave., Boston, Mass.
- MORSS—boat whistles, anchors, ignition batteries, coils, levers, pitchometers & hermetic cases, A. S. Morss Co., 210-212 Commercial St., Boston, Mass.
- MOSLER—timers, distributors & marine spark plug protectors, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- MOSSBERG—roller bearings, Standard Machinery Co., 7 Beverly St., Providence, R. I.
- MOSSO'S MONARCH—tempering compounds, C. A. Moss, Chicago, Ill.
- MOTART STANWOOD—auto steps, power hack saws & cranes & hoists, Motor Parts Co., Plainfield, N. J.
- MOTOLINE—oils & greases, E. F. Houghton & Co., 240 W. Somerset St., Phila., Pa.
- MOTOR—ignition batteries, Chicago Battery Co., 2600-10 Wabash Ave., Chicago, Ill.
- \*MOTOR CAR—heaters, Motor Car Heater Co., 84 Adams St., Chicago, Ill.
- MOTORITE—packing, Crandall Packing Co., Palmyra, N. Y.
- MOTORKIT—tool kits, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.
- MOTORLUBE—oil & grease, E. A. Tygert Co., 126 N. Front St., Phila., Pa.
- MOTOR MENANGE—lunch baskets, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.
- MoToRoL—cylinder oils, New York & New Jersey Lubricant Co., 165 Broadway, N. Y. City.
- MOTSINGER AUTO-SPARKER—dynamos & charging boards, Motsinger Device Mfg. Co., Pendleton, Ind.
- MOTSINGER—exhaust mufflers for gasoline auto engines, muffler cut-outs, magnetos & switches, Motsinger Device Mfg. Co., Pendleton, Ind.
- MOTZ—clincher tire, Motz Clincher Tire & Rubber Co., Akron, Ohio.
- MOUND—tool kits, cotter pin extractors, cold chisels, carbon & bearing scrapers & screw drivers, Mound Tool & Scraper Co., 1606-1608 N. Broadway, St. Louis, Mo.
- MT. CARMEL—hardware, auto, The Walter W. Woodruff & Sons Co., Mt. Carmel, Conn.
- MUELLER—motorcycle tandem attachments, rubber grips, motorcycle lamp brackets & pedal repair pins, L. J. Mueller, 6417 Woodland Ave., S. E., Cleveland, Ohio.
- MUELLER—radial drills, The Mueller Machine Tool Co., 2427-29 Colerain Ave., Cincinnati, O.
- MULLINS—gasoline motor boats, W. H. Mullins Co., Salem, Ohio.
- MULTIPLE—dry cells, National Carbon Co., Lock Drawer "L," Cleveland, O.
- MULTIPLE—lubricators, The Lunkenheimer Co., Cincinnati, O.
- MULTIPLEX—ignition batteries, National Carbon Co., Lock Drawer "L," Cleveland, O.
- \*MULTI-SPEED—gasoline auto motors, Palmer-Moore Co., Talman & Oneida Sts., Syracuse, N. Y.
- MULTO—wrenches, Lowell Wrench Co., 100 Exchange St., Worcester, Mass.
- MUNCIE—axles, brakes, buggy type auto parts, differential gears, countershafts, gasoline auto engines, gears & pinions, speed change gears, brake drums & sprockets, Muncie Gear Works, Muncie, Ind.
- MUNSING—axles, clutches & speed change gears, Munsing Motor Car Co., Hoboken, N. J.
- MURPHY—current rectifiers, Murphy Electricity Rectifier Co., Rochester, N. Y.
- MURPHY—curtain fasteners, moulding, bow separators, handles, etc., The G. W. J. Murphy Co., Merrimac, Mass.
- MURRAY—automobile jacks, Bicycle Step Ladder Co., 65 Randolph St., Chicago, Ill.
- MURRAY—auto pneumatic tires & inner shoes, A. L. Murray, Grand Rapids, Mich.
- MURRAY—axles & auto wheels, The Murray Safety Wheel & Axle Co., 442 Atlantic Ave., McKeesport, Pa.
- MURRAY—round tire boxes, Joseph Murray, Newton, Mass.
- MURRAY—separator & liner, Non-Corrosive Metal Co., Inc., Watertown, Mass.

MURRAY DOUBLE LOCK & MURRAY  
FIRST-AID—tire repair patches, A. L. Murray, Grand Rapids, Mich.  
MUSHET—steels, imported by B. M. Jones & Co., Inc., 141 Milk St., Boston, Mass.  
MUSSELMAN—coaster brakes, Miami Cycle & Mfg. Co., Grand Ave., Middletown, Ohio.  
MUTUAL—universal joints, The Mutual Machine Co., 25 Wells St., Hartford, Conn.  
MYERS—auto seats & spring repair devices, Dayton Auto Top Co., Dayton, Ohio.  
MYERS AERTITE—hand tire pumps, Columbia Grey Iron Co., Columbia, Pa.  
MYHTIB—rubber preservatives, "Myhtib" Composition Co., 284 Asylum St., Hartford, Conn.

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N C—rustless nickel & phosphor bronze castings, Non-Corrosive Metal Co., Inc., Wattertown, Mass.  
N. E.—gears & pinions, differential gears & speed change gears, New England Gear Works, 100 Purchase St., Boston, Mass.  
N. S. U.—two-speed gears, side & fore cars & delivery vans, engine clutches, motorcycle accessories, belt fasteners, belt punches, puncture proof bands & motorcycle belts, N. S. U. Motor Co., 206 W. 76th St., N. Y. City.  
NACEFAS—oily waste cans, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.  
NADALL—demountable rims & tire lugs, Nadall-Van Sicklen Mfg. Co., 1339 Michigan Ave., Chicago, Ill.  
NAPOLEON—castings, The City Brass Foundry Co., 5310-32 St. Clair Ave., Cleveland, Ohio.  
NAPOLEON—shock absorbers, Oil Tempering Spring Co., Chicopee Falls, Mass.  
NASH—stationary engines, National Meter Co., 84-86 Chambers St., N. Y. City.  
NASSAU—automobile tires, Thermoid Rubber Co., Trenton, N. J.  
NASSAU—bicycles & tires, New York Sporting Goods Co., 17 Warren St., N. Y. City. (Jobbers.)  
NATHAN—sleeve protectors, rubber capes, leggings, tool rolls, rain & dust aprons, inner tube bags, auto lamp covers, grease bags, rubber robes, coat rail bags, trunk covers, top covers, starting handle holders, auto & tire trunks, wash aprons & spark plug cases, Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City, N. Y.  
NATHAN LOCK FLAP—tire cases, Nathan Novelty Mfg. Co., 84-90 Reade St., N. Y. City.  
NATIONAL—battery charging rheostats, National Electric Supply Co., 1110-12 W. Lake St., Chicago, Ill.  
NATIONAL—bicycles, National Cycle Mfg. Co., Bay City, Mich.  
NATIONAL—bicycle wrenches, Frank Mossberg Co., Attleboro, Mass.  
NATIONAL—carburetors, W. D. Pulver, Salem, N. H.  
NATIONAL—chisels, tool kits & cotter pin pullers, National Cutlery Co., Detroit, Mich.  
NATIONAL—coils & spark plugs, National Coil Co., 412 Michigan Ave., E., Lansing, Mich.  
\*NATIONAL—cotter pins, rivets, nuts & bolts, National Screw & Tack Co., Cleveland, Ohio.  
NATIONAL, NATIONAL-SPECIAL & NATIONAL-PRESSURE—fuel level indicators, National Motor Supply Co., Cleveland, O.  
NATIONAL—gasoline storage outfits, National Oil Pump & Tank Co., 411-413 E. First St., Dayton, O.  
NATIONAL—hand shears, National Cutlery Co., Westmoreland & Boudinot Sts., Phila., Pa.  
NATIONAL—jacks, National Jack & Mfg. Co., 132 & 34 S. Clinton St., Chicago, Ill.  
NATIONAL—keyseating machines, National Machine Tool Co., 212 Lawrence St., Cincinnati, Ohio.  
NATIONAL—lathe & drill chucks, Oneida National Chuck Co., Oneida, N. Y.  
NATIONAL—linseed oil & auto body soap, The National Tripolio Co., 543 W. Goodale St., Columbus, Ohio.  
NATIONAL—lock washers, curtain fasteners, curtains, sash locks & balances, National Lock Washer Co., 65 Johnson St., Newark, N. J.  
NATIONAL—oil burners, Judson L. Thompson Mfg. Co., Waltham, Mass.  
NATIONAL—oil filters & oil separators for turret lathe chips, National Separator & Machine Co., Boston, Mass.  
NATIONAL—packing, National Metallic Packing Co., Oberlin, O.  
NATIONAL—speed indicators, National Speed Indicator, 147 Columbus Ave., Boston, Mass.  
NATIONAL—storage batteries, The United States Light & Heating Co., 30 Church St., N. Y. City.  
NATIONAL—tires, pneumatic auto, Automobile Tire Co., Inc., 1625 Broadway, N. Y. City.  
NATIONAL—tire pressure registers, Kellogg Mfg. Co., E. Main & Circle Sts., Rochester, N. Y.  
NATIONAL—tool kits, reamers, twist drills, taps & screw plates, The Whitaker Mfg. Co., 30 W. Monroe St., Chicago, Ill.  
NATIONAL—twist drills, wrenches, taps, reamers and screw plates, Whitaker Mfg. Co., 509 W. Monroe St., Chicago, Ill.  
NATIONAL—vulcanizers, National Motor Supply Co., Cleveland, Ohio.  
NATIONAL—wind shields, National Auto Top Co., 1904 Broadway, N. Y. City.  
NATIONAL-AIRLESS—tires, airless, Airless Tire Co., 806 W. Washington St., Indianapolis, Ind.  
NAUGATUCK SEAMLESS—carburetor floats, Naugatuck Mfg. Co., Naugatuck, Conn.  
\*NAYS—metal polish, Bott Bros. Mfg. Co., 166 N. High St., Columbus, O.  
N-DUR-AL—metal polish, Shi-Nal Co., 413 Emmet Road, Toledo, Ohio.  
NEAL—tire repair kits, F. M. Neal Co., 1048 E. Main St., Bridgeport, Conn.  
NEARKID—gauntlets, Seamless Rubber Co., New Haven, Conn.  
NELSON—paints & colors, Keene, Peaslee & Co., Amesbury, Mass.  
NELSON—wood polishes, metal polish & leather dressing, Jewel Mfg. Co., 21st St. & Marshall Blvd., Chicago, Ill.  
NEPTUNE—water-proof belting, Graton & Knight Mfg. Co., 94-104 Bloomingdale Rd., Worcester, Mass.  
NEVER-BREAK—brake drums, pressed steel tanks & metal washers, The Avery Stamp- ing Co., Cleveland, Ohio.  
NEVER-BREAK—lamp guards, Frank W. Morse, 516 Atlantic Ave., Boston, Mass.  
NEVER KREEP—tire protectors, John L. G. Dykes Co., Chicago, Ill.  
NEVER-FAIL—automatic oil & gasoline guns, J. A. Harps Mfg. Co., Greenfield, Ohio.  
NEVER LEAK—oil cans, The Delphos Mfg. Co., Delphos, O.  
NEVERLEAK—tire fillings & injectors, Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y.  
NEVER LEAK—tire valves, Huestis Mfg. Co., Bristol, R. I.  
NEVER-MISS—spark plug, voltmeters, ammeters & voltmeters, terminal battery connections & auto clocks, Never-Miss Spark Plug Co., Lansing, Mich.  
NEVEROUT—lamps (bicycle, auto & boat), acetylene gas generators, dome lights & boat lighting outfits, Rose Mfg. Co., 911 Arch St., Phila., Pa.  
NEVERQUIT—timers, Motorparts Co., St. Joseph, Mich.



- NEVER RUB—bow separators & brass top fixtures, Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass.
- NEVER SINK—boat pillows & cushions, Chicago Flag & Decorating Co., 350-52 Wabash Ave., Chicago, Ill.
- \*NEVER-SLIP—anti-skid devices, The Empire Auto Specialty Mfg. Co., Berea, Ohio.
- NEVER-SLIP—hose clamps, Cleveland Pneumatic Tool Co., 6416 Hawthorne Ave., Cleveland, Ohio.
- NEVERSLIP—nipple grips (cycle), Keyser Fry, 723-25 Chestnut St., Reading, Pa.
- NEVERSPILT—file & tool handles, Niagara Handle & Ferrule Co., 321 N. Holliday St., Baltimore, Md.
- NEVERTURN—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.
- NEVILLE—repair truck, T. Neville, Oshkosh, Wis.
- NEUBERN'S—linseed oil hand soap, Automobile Repair Co., 1103-1105 Pine St., St. Louis, Mo.
- NEW BRITAIN—portable vise stands, tool racks, lathe racks, shelving, bench legs & drawers & steel stock racks, The New Britain Machine Co., New Britain, Conn.
- NEW CENTURY—lever locks, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- NEW COLUMBIA—acetylene lamp burners, J. B. Carroll, 217 W. Illinois St., Chicago, Ill.
- NEW DEPARTURE—bicycle & auto bells, bicycle coaster brakes & ball bearings, New Departure Mfg. Co., Bristol, Conn.
- NEW EASY—bolt clippers, H. K. Porter, 6 Ashland St., Everett, Mass.
- NEW ENGLAND—watches, The New England Watch Co., Waterbury, Conn.
- NEW ERA—bearing metal, polishing compounds, boiler compounds, packing & aluminized zinc, The New Era Mfg. Co., Kalamazoo, Mich.
- NEW HAVEN—lathes, New Haven Mfg. Co., New Haven, Conn.
- NEW HAVEN—window anti-rattlers & tail-board fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- NEW HAVEN—wind shields, Holcomb Co., 105 Goffe St., New Haven, Conn.
- NEW HOLLAND—stationary & portable gasoline engines & rip & cross cut saws, New Holland Machine Co., New Holland, Pa.
- NEW IDEA—portable electric lights & heat retaining bottles, New Idea Sales Co., Corning, N. Y.
- NEW JERSEY—copper paints & metal polish, New Jersey Paint Works, Wayne & Tremont Sts., Jersey City, N. J.
- NEWLIN'S HOLD TIGHT—lamp adapters, W. D. Newlin, Paxton, Ill.
- NEW LITTLE GIANT—power hammers, Mayer Bros., 126 W. Rock St., Mankato, Minn.
- NEWMASTIC—tire filling & filled tires & inner tubes, Newmastic Tire Co., 151 W. 68th St., N. Y. City.
- NEW MODEL—stationary gas & gasoline engines, National Engineering Co., Saginaw, Mich.
- \*NEWPORT—spark plugs, The K & T Mfg. Co., 32 Atlantic Ave., Boston, Mass.
- NEW PROCESS—drill rod, steel wire, tool steel & roller ball steel, New Process Steel Co., Lancaster, Pa.
- \*NEW PROCESS—gasoline & liquid for hill climbing & endurance tests, Binder & Uller, Tidoute, Pa.
- NEW PROCESS—rawhide pinions & metal gears, auto transmission gears, compensating gears, The New Process Raw Hide Co., 500 Plum St., Syracuse, N. Y.
- NEW PRODUCT—auto gasoline, Oil City Oil & Grease Co., Oil City, Pa.
- NEW SAMSON—automobile jacks, Oliver Mfg. Co., 326 S. Desplaines St., Chicago, Ill.
- NEWTEEN—cupolas, ladles, etc., Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.
- NEWTON—pulverizer & roller, Macgowan & Finigan Foundry & Machine Co., St. Louis, Mo.
- NEWTON—tops, W. H. Newton & Son, 127 Elm St., Cortland, N. Y.
- NEW WEST—top dressing, West Mfg. Co., 120 N. Madison St., Rockford, Ill.
- NEW YANKEE—surface & drill grinders, Willmarth & Morman Co., 583 Canal St., Grand Rapids, Mich.
- NEW YORK—slat irons, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- NEW YORK—valve grinding compounds, Hezlinger Bros., 202 E. 74th St., N. Y. City.
- NEW YORK AUTO WIRE—ignition cable, New York Insurance Wire Co., 114 Liberty St., Boston, Mass.
- NIAGARA—grease cups, Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
- NIAGARA—motors, electric, auto, Manlius Motor Co., Manlius, N. Y.
- NIAGARA—power presses, shears & punches, hand punches, & hand & foot shears, Niagara Machine & Tool Works, Jefferson, Superior & Randall Sts., Buffalo, N. Y.
- NIAGARA—rubber hose, Boston Belting Co., 256-60 Devonshire St., Boston, Mass.
- NIAGARA—vehicle batteries, Niagara Lead Co., Niagara Falls, N. Y.
- NIAGARA SPRAY—carburetors, Steinbrenner & Co., 107 Victoria St., Buffalo, N. Y.
- NICE—wood fillers & colors, Eugene E. Nice, 272 S. 2nd St., Phila., Pa.
- NICHOLS—kerosene marine motors & stationary motors, Nichols Power Co., Stamford, Conn.
- NICHOLSON—files & rasps, Nicholson File Co., Providence, R. I.
- NICHOLSON'S—expanding mandrels, taps & shaft couplings, W. H. Nicholson & Co., Wilkes-Barre, Pa.
- NICOLINE—rust preventives, Jas. S. Longhurst, Jr., Lynbrook, L. I., N. Y.
- NIELS—gasoline storage outfits, Wm. Niel & Co., 615 Division St., Chicago, Ill.
- NIGHTINGALE—whistles & motorcycle horns, Nightingale Whistle Mfg. Co., 1777 Broadway, N. Y. City.
- 1900—dry batteries, Nungesser Electric Battery Co., 27-33 King St., Cleveland, Ohio.
- NOERA—automobile tire hand pumps, cycle & motorcycle pumps & squirt oilers, Noera Mfg. Co., Waterbury, Conn.
- NO FLICKER—dynamos, The W. H. Coles Sales Organization, Troy, Ohio.
- NOFLUX—aluminum solder, Reinhold No-Flux Aluminum Solder Co., 50 Demarest St., Newark, N. J.
- \*NO FREEZE—anti-freezing compound, Alger Laboratories, 294 Washington St., Boston, Mass.
- NOISLESS—ratchets, The Addison Mfg. Co., 1516 Williamson St., Madison, Wis.
- NOKARBO—oils, Great Western Oil Co., 2855 E. 35th St., Cleveland, O.
- NO-KARBON—oil, Eagle Oil & Supply Co., 104 Broad St., Boston, Mass.
- \*NO-KLOG—fuel strainers, Standard Gasoline Filter Co., Attleboro, Mass.
- NOKORODE—soldering paste, M. W. Dunton Co., Providence, R. I.
- NOKORODO—soldering fluid, The Webb Co., 60-62 Shipman St., Newark, N. J.
- NO KOROS—unions & fittings & malleable iron castings, Illinois Malleable Iron Co., 1801-25 Diversey Blvd., Chicago, Ill.
- NO-MOR-AUTO-FREEZE—anti-freezing compound, The Auto Shop Co., Cleveland, Ohio.
- NO-NAME—acetylene lamp burners, American Lava Co., Chattanooga, Tenn.
- NON-BURN—asbestos brake lining, H. W. Johns-Manville Co., 100 William St., N. Y. City.
- NON-FLUID—oils, N. Y. & N. J. Lubricant Co., 14-16 Church St., New York City.
- NONFRIXO—grease, The Cincinnati Oil Works Co., Cincinnati, O.
- NON-GRAN—bronze, brake linings & cored bars, American Bronze Co., Berwyn, Pa.
- NONKORODA—boiler & radiator compound, The Nonkoroda Co., 25 & 227 New Chambers St., N. Y. City.



NONPAREIL—auto generator valves & oil cups, The Lunkenheimer Co., Cincinnati, O.

NONPAREIL—carburetors, A. J. Meyer, Castle Point, Hoboken, N. J.

NONPAREIL—horns, horn bulbs & horn reeds, Nonpareil Horn Mfg. Co., 139-147 Emerson Place, Brooklyn, N. Y.

NON-STRAIN—goggles, Ophthalmoscope Co., Toledo, Ohio.

NON-SUCH—metal polishes, Hercules Chemical Works, 1904 W. Van Buren St., Chicago, Ill.

NON-SWELL—rawhide gears & pinions, Widmer Machine Works, Inc., 292-94 East 135th St., N. Y. City.

NOONAN—valve pliers, cotton pin remover, crank swage, hand-forged tools, chain repair tool, inner tube tester, inner tube remover, soft face vise jaws, chain repair clamps, crank remover, valve truing tools & valve spring lifters, Noonan Tool & Machine Works, 103½-105 Dominick St., Rome, N. Y.

NORFOLK—gasoline marine motors, Norfolk Motor Co., Wollaston, Mass.

NORMA—ball bearings, imported by Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City.

NORTH AMERICAN—gasoline automobile engines, North American Motor Corporation, New London, Conn.

NORTH CAROLINA—mica for insulation, D. T. Vance, Plumtree, N. C.

NORTHERN—cranes & hoists, Northern Engineering Works, Chene & Atwater Sts., Detroit, Mich.

NORTH STAR—metal polish, American Metal Polish Co., 89 Winslow Ave., West Somerville, Mass.

NORTHWAY—gasoline auto engines, Northway Motor & Mfg. Co., Maybury Ave., Detroit, Mich.

NORTHWESTERN—ignition batteries, electric auto lamps & boat lighting batteries, Northwestern Storage Battery Co., 140 Mason St., Milwaukee, Wis.

NORTON—grinding wheels, Motor Grinding Co., Barbers Crossing, Worcester, Mass.

NORWOOD—portable turntables & jacks, Auto & Accessories Mfg. Co., 1416 Madison Ave., Baltimore, Md.

NO-SHAMMY—funnels, unions & elbows, grease cups & device for flaring out gasoline pipings, The No-Shammy Co., 5711 Hough Ave., N. E., Cleveland, O.

NOVELTY—hoods, dust & mud shields, mud guards & tanks, Novelty Mfg. Co., Jackson, Mich.

\*NOVO—stationary gas engines, The Hildreth Mfg. Co., 49 W. Hill St., Lansing, Mich.

NOXAL—auto body polish, NoXal Polish Mfg. Co., 1238-44 Belmont Ave., Phila., Pa.

NOYE—radiators, hoods, dashes & tool boxes, Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

NUE—ignition batteries, Union Battery Co., Belleville, N. J.

\*NUGGET—wood polish, Nugget Polish Co., Ltd., 299 Broadway, N. Y. City.

NUGLOSS—automobile polish, The R. M. Hollingshead Co., Camden, N. J.

NO. 407—nickel babbit, Mogul Metal Co., 149-151 Larned St., Detroit, Mich.

NUMBER NINE—oil storage outfits, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.

NO. 1 LOG—speed & distance recording instruments, Nicholson Ship Log Co., Cleveland, O.

NO. 2 SUPERIOR—overhead vehicle washers, The Vehicle Specialty Co., Inc., 20 State St., Hartford, Conn.

NUTTALL—gears, pinions & flexible couplings, R. D. Nuttall Co., 925 Fayette St., Pittsburgh, Pa.

NYFLEXMET—metallic hose and flexible metallic tubing, American Metal Hose Co., 173-77 Lafayette St., N. Y. City.

NYOIL—oils, William F. Nye, New Bedford, Mass.

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O. B.—mechanical tire inflators, O. Fenstermacher, 311 S. 5th St., Minneapolis, Minn.

O. K.—battery connections, O. K. Connector Co., 49 Waldo St., Worcester, Mass.

O. K.—forgings, disc grinders, lathe dogs, lathes, wrenches & machinery parts, O. K. Tool Holder Co., Shelton, Conn.

O. K.—friction clutch pulleys, The O. K. Clutch & Machinery Co., Phila., Pa.

O. K.—spark plugs, Pettingell-Andrews Co., 156-160 Pearl St., Boston, Mass.

OAKES—oils, greases & auto body cleansing compounds, Fred. T. Oakes, 150 Nassau St., N. Y. City.

OAK LEAF—leather trimming, J. H. Halsey & Smith, Ltd., Newark, N. J.

O'BANNON—leather top & upholstery materials, O'Bannon Corporation, 74 Duane St., N. Y. City.

OBERDORFER—pumps, M. L. Oberdorfer Brass Co., 804-808 E. Water St., Syracuse, N. Y.

O-CEDAR—wood polish, Channell Chemical Co., 1534 W. Lake St., Chicago, Ill.

ODEE—stationary gas engines, Odee & Koto Machine Co., 642 Race St., Beloit, Wis.

OESTERLEIN—horizontal, plain & universal milling machines, universal cutter & tool grinders, The Oesterlein Machine Co., Cincinnati, Ohio.

OHIO—jacks, Elite Mfg. Co., Ashland, O.

OHIO—portable electric lights & electric bicycle lamps, ignition batteries & dynamos, Ohio Electric Works, 6304 Ellen Ave., N. W., Cleveland, O.

OHIO—valves, engine & misc., to order, Ohio Brass Co., Mansfield, O.

OHIO SPECIAL—metal tubing & seamless steel, The Ohio Seamless Tube Co., Shelby, O.

OILDAG PASTE—graphite & oils, Acheson Oildag Co., Niagara Falls, N. Y.

OILEJAMMER—lubricant injectors, The Motor Car Supply Co., 1451-1455 Michigan Ave., Chicago, Ill.

\*OILEO—auto oils, Harrington Lubricant Co., 1691 Broadway, N. Y. City.

\*OILINE—grease, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, O.

\*OILRIGHT—lubricant injectors & oil cans, Harvey Mfg. Co., 19 Montrose St., Rochester, N. Y.

\*OILRIGHT—oil cans, Gem Mfg. Co., Pittsburgh, Pa.

OILZUM—oils, greases & wood polish, The White & Bagley Co., Worcester, Mass.

OKONITE—ignition cable & insulating tape, The Okonite Co., 253 Broadway, N. Y. City.

OLDBERG—mufflers & muffler cutouts, Oldberg Mfg. Co., Detroit, Mich.

OLD OAK—leather belting, National Leather Belting Co., 29 Ferry St., N. Y. City.

OLDS—stationary engines, Seager Engine Works, 954 Chestnut St., Lansing, Mich.

OLEO—spark plugs, imported by The Motor Car Equipment Co., 55 Warren St., N. Y. City, N. Y.

OLIVER—speed indicators, Stecker Electric & Machine Co., Detroit, Mich.

OLIVER'S E-Z—automobile jacks, Oliver Mfg. Co., 326 S. Desplaines St., Chicago, Ill.

OLIVINE—auto body cleansing compound, F. Kenney Mfg. Co., 360-368 Dorchester Ave., Boston, Mass.

OMEGA—grease cups, Tell City Foundry & Machine Works, Tell City, Ind.

ONEIDA—drill chucks, Westcott Chuck Co., Oneida, N. Y.

ONE STROKE—surface grinders, O. S. Walker & Co., 25 Union St., Worcester, Mass.

O'NEIL—vulcanizers, inner tube protectors, bead moulds, air bags, tire sleeves, tire repair articles & cements, O'Neil Tire & Protector Co., Akron, O.

ONE-LOCK—adjustable reamers, Wm. J. Smith Co., 424 State St., New Haven, Conn.

ONE PIECE—propellers, Perkins Wheel Co., Grand Rapids, Mich.

ONLY—band saw filing & setting machines, Black Diamond Saw & Machine Works, Natick, Mass.

ONLY COTTER SETTER—cotter pin pullers & setters, Auto Spring Repairer Co., 123 Liberty St., N. Y. City.

ONTARIO—gasoline marine & auto engines, Ontario Iron Works, Pulaski, N. Y.

ON-THE-JOB—tool grinders, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.

ORANGE—jacks, The Orange Machine & Mfg. Co., 10-14 Stetson St., Orange, N. J.

ORIENT—oil auto lamps, R. E. Dietz Co., 60 Lighthouse St., N. Y. City.

ORIOLE—clutch leather, I. B. Williams & Sons, Dover, N. H.

ORIOLE—gasoline marine engines, Page Engineering Co., 113-121 E. York St., Baltimore, Md.

ORIOLE—wind shields, Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill.

ORSWELL—magnetic spark plugs, Orswell Ignition Co., 29 Haverhill St., Boston, Mass.

OSBORN—spark plug brushes, roughing brushes, paint & varnish brushes, emery grinders & polishing & buffing machines, Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

OSBURN—batteries, magnetos, spark coils, spark plugs & timers, Osborn Electric Co., 66 Fort St., E., Detroit, Mich.

OSCILLUM—spark gaps, Herz & Co., 203-205 Lafayette St., N. Y. City.

OSWEGO—wrenches, Oswego Tool Co., Oswego, N. Y.

OTTO—stationary gas & gasoline engines, The Otto Gas Engine Works, 33rd & Walnut Sts., Phila., Pa.

\*OUGHTT—hood & scarf, James R. Keiser, 11-19 W. 19th St., N. Y. City.

OUR VERY BEST—tire repair tools, Hibbard Spencer, Bartlett & Co., Chicago, Ill.

OVAL DRIVE—twist drills, Lancaster Machine & Knife Works, Lancaster, N. Y.

OWEN—milling machines, The Owen Machine Tool Co., Springfield, O.

OWL—carbon removers, Western Chemical Mfg. Co., 208 Fourth St., Milwaukee, Wis.

OWL—grease cups, The Lunkenheimer Co., Cincinnati, Ohio.

\*OXFORD—shock absorbers, Oxford Mfg. Co., Oxford, Mich.

OZONE—baking enamels, Chase, Roberts & Co., Fifth St. & West Ave., Long Island City, N. Y.

P

\*P. D. Q.—gasoline marine motors, The Huntington Mfg. Co., Main St., New Rochelle, N. Y.

P. D. Q. C.—pipe cutting & threading machines, Bignall & Keeler Mfg. Co., Edwardsville, Ill.

PF SPECIAL—rolled bars of carbon steel, Philadelphia Steel & Forge Co., 50 Church St., N. Y. City.

PF STANDARD—alloy steels, Philadelphia Steel & Forge Co., 50 Church St., N. Y. City.

P. K.—shovels & polishing & buffing wheels, Frederic B. Stevens, Detroit, Mich.

P. N. S.—timers & tire holders, Philadelphia Novelty Supply Co., 2031-33 N. 29th St., Phila., Pa.

PR—tank level indicators, PR Manufacturing Co., 621-659 Bellevue Ave., Detroit, Mich.

P. & S.—trunk racks, Chester Engineering & Machine Co., Front & Penn Sts., Chester, Pa.

P. S. & CO.—inner tubes, auto, Parker, Stearns & Co., Sheffield & Belmont Aves., Brooklyn, N. Y.

P. T. C.—tire inflators, Pacific Tucking & Mfg. Co., 471 18th St., Brooklyn, N. Y.

PACKARD 24-30—auto cylinder oil, Greenslade Oil Co., Detroit, Mich.

PACKARD—grease, The Havoline Oil Co., 80 Broad St., N. Y. City.

PACKARD—ignition cable & insulating tape, Packard Electric Co., Warren, O.

PAGE—stationary gasoline engines, Page Engineering Co., 113-121 E. York St., Baltimore, Md.

PAIGE—crucibles, metal melting, Paige Retort & Crucible Co., Taunton, Mass.

PAIL-LIGHT—dry cells, National Carbon Co., Lock Drawer "L," Cleveland, O.

PA-HAK-HA—gasoline motor boats, Detroit River Canoe Works, 274-280 Wight St., Detroit, Mich.

PALM—vacuum cleaners, The Palm Engineering Co., 34-36 Bates St., Detroit, Mich.

PALMBLA—carburetors, North Chicago Machine Co., North Chicago, Ill.

PALMER—bicycle tires & motorcycle tires, B. F. Goodrich Co., Akron, O.

PALMER—gluing clamps, A. E. Palmer & Sons, Owosso, Mich.

PALMETTO—cup grease, Tiona Refining Co., Indianapolis, Ind.

PALMETTO—packing, Greene, Tweed & Co., 109 Duane St., N. Y. City.

PALM-U-NEEK—grease, Manhattan Oil Co., 51 Front St., N. Y. City.

PAN-AMERICAN—wood polish, Chas. E. Miller, 97-101 Reade St., N. Y. City.

PANEL—rubber covered steps, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.

PANGBORN MODERN—sand blast systems, Thos. W. Pangborn Co., 90 West St., N. Y. City.

PANHARD—oil, grease & graphite, Geo. J. Haws, 73 Pine St., N. Y. City.

PANHARD—side levers, Locke Regulator Co., Salem, Mass.

PAN-O-LITE—cylinder oils & auto body soap, Wm. F. Miller's Sons, Nott Ave. & Hancock St., Long Island, N. Y. City.

PANTASOTE—automobile trimmings & mackintosh goods for slip covers, The Pantasote Co., 11 Broadway, Chicago, Ill.

PAOS—hand cleaning soap, Hopewell Bros., 29 Chapel St., Newton, Mass.

\*PAOWNYC—wind shields, The O. M. Edwards Co., Plum & Solar Sts., Syracuse, N. Y.

PARA FLEX—cable, The Post & Lester Co., 20 Sargeant St., Hartford, Conn.

PARAGON—auto oils & grease, Loos & Dilworth, 134 S. Front St., Phila., Pa.

PARAGON—lubricators, The Lunkenheimer Co., Cincinnati, O.

PARAGON—oil cans, Consolidated Fruit Jar Co., New Brunswick, N. J.

PARAGON—reversing gears for motor boats and friction clutches for boats, Evans Stamping & Plating Co., Cushman St., Taunton, Mass.

PARAGON—two-wheel chemical fire engines for garages, Jas. Boyd & Bro., 22nd St., bet. Vine & Race Sts., Phila., Pa.

PARALLELS—planers, O. S. Walker & Co., 25 Union St., Worcester, Mass.

PARAMOUNT—boiler compounds, Frederick Schilling, 365 Pearl St., N. Y. City.

PARAMOUNT—oil, Wm. T. Baker, 228-32 Suydam Ave., Jersey City, N. J.

PARK CITY—gasoline marine motors, Consolidated Carpet Sewing Machine Co., Bridgeport, Conn.

PARKER—air compressor & complete whistle outfits, Brunner Mfg. Co., Utica, N. Y.

PARKER—carburetors, timers, circulation pumps, speedometers, pump & odometer parts, gears & bushings, Parker White Metal & Machine Co., East 10th St. & Phila. & Erie R. R., Erie, Pa.

PARKER—electric auto lamps & machinists' clamps, John L. Parker Co., Worcester, Mass.

PARKER—gasoline auto motors, The Parker Motor Co., Hartford, Conn.

PARKER—rims, Newmastic Tire Co., 151 W. 68th St., N. Y. City.

- PARKER—vises & ratchets, Chas. Parker Co., Meriden, Conn.
- PARKER'S—vests, socks & boots, Jno. H. Parker Co., 25 James St., Malden, Mass.
- PARKER'S ARCTIC—jackets, Jno. H. Parker Co., 25 James St., Malden, Mass.
- PARKINSON—transmission auto gears, Parkinson Gear Co., Rensselaer, Ind.
- PARKO—vulcanizing solution, F. B. Parks Co., 173 Prescott St., Grand Rapids, Mich.
- PARROTT—varnishes, Parrott Varnish Co., Bridgeport, Conn.
- PARTINE—parting sand for moulds, The Foundry Specialty Co., Cincinnati, Ohio.
- PATER NOSTER—shock absorbers, Herz & Co., 203-205 Lafayette St., N. Y. City.
- PATHFINDER—automobile axles, Geo. A. Weaver, Newport, R. I.
- PATTERSON—wireless battery holder for autos, Stanley & Patterson, 23 Murray St., N. Y. City.
- PAYNTER—auto tires, J. Ellwood Lee Co., Conshohocken, Pa.
- PEACOCK BLUE—for blueing metal, Jas. S. Longhurst, Jr., Lynbrook, L. I., N. Y.
- PEARL—wiping rags, Continental Waste Co., 22 Clayton St., Boston, Mass.
- PEARL GLASS—lens mirrors, Macbeth-Evans Glass Co., Pittsburg, Pa.
- PEASE—gasoline marine motors, The Fred J. Pease Co., 36 Court St., Grand Rapids, Mich.
- PECK—electric, oil & acetylene lamps for autos, Scoville & Peck Co., 15 W. Wooster St., New Haven, Conn.
- PEDERSEN—lubricators, Pedersen Mfg. Co., 636-644 First Ave., N. Y. City.
- PED PUMP—special tools, Pedersen Mfg. Co., 636-644 First Ave., N. Y. City.
- PEERLESS—belts for pumps, fans, oilers, sparkers, electric generators, motors, etc., The Peerless V Belt Co., 334-338 S. Clinton St., Chicago, Ill.
- PEERLESS—curtain fasteners, automobile seats, Metal Stamping Co., 30-50 Hubert St., N. Y. City.
- PEERLESS—double swivel vises, Spitzli Mfg. Co., Utica, N. Y.
- PEERLESS—drilling compound, Racine Gas Engine Co., Racine Junction, Wis.
- PEERLESS—electric motors for driving machinery, dynamos & charging apparatus, The Peerless Electric Co., Warren, Ohio.
- PEERLESS—enamel, Akron Varnish Co., Akron, O.
- PEERLESS—fuel economizers, J. S. Ridley, 1878 Broadway, N. Y. City.
- PEERLESS—gasoline marine motors, Sibley-Houffey Machine Co., 180 Brush St., Detroit, Mich.
- PEERLESS—grease, The O. F. Zurn Co., Broad & Lehigh Ave., Phila., Pa.
- \*PEERLESS—ignition batteries & lamp lighting batteries, Peerless Igniter Mfg. Co., 947 Marcy Ave., Brooklyn, N. Y.
- PEERLESS—jacks, Oliver Mfg. Co., 326 S. Desplaines St., Chicago, Ill.
- PEERLESS—juvenile foot & hand propelled vehicles, Toledo Metal Wheel Co., Toledo, Ohio.
- PEERLESS—magnetos, Tritt Electric Co., Union City, Ind.
- PEERLESS—miniature Tungsten lamps, Warren Electric & Specialty Co., Warren, Ohio.
- PEERLESS—oils & greases, A. & N. Oil Co., 1931 Broadway, N. Y. City.
- PEERLESS—oil, grease & gasoline, Ellsworth & Armstrong Oil Co., 26 Stone St., N. Y. City.
- PEERLESS—perforated chaplets, The Hill & Griffith Co., 1248-1262 State Ave., Cincinnati, Ohio.
- PEERLESS—pipe cutting & threading machines, Bignall & Keeler Mfg. Co., Edwardsville, Ill.
- PEERLESS—portable crane & hoist, Wm. S. Nicholls, 253 Broadway, N. Y. City.
- PEERLESS—shock absorbers & auto bumpers, J. H. Sager Co., 265 South Ave., Rochester, N. Y.
- PEERLESS—storage batteries, United Electric Storage Battery Co., 2107 Pine St., St. Louis, Mo.
- PEERLESS—tires, pneumatic auto., Peerless Tire Co., 1610 Michigan Ave., Chicago, Ill.
- PEERLESS—tire cements, vulcanizing solution, tire repair kits, tire sleeves & tire patches, The Peerless Cement Co., 39 Viaduct, Akron, O.
- PEERLESS—tops, auto & boat, Peerless Buggy Top Co., S. W. cor. Central Ave. & York St., Cincinnati, Ohio.
- PEERLESS—top dressing, Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y.
- PEERLESS—vacuum cleaners, The New Idea Sales Co., Corning, N. Y.
- PEERLESS—valve grinding compounds, J. F. Bornschein & Co., 2351 Indiana Ave., Chicago, Ill.
- PEERLESS—wind shields & carbon removers, J. H. McCullough & Son, 219 N. Broad St., Phila., Pa.
- PEERLESS—wood polish, Peerless Cleaner Co., Glenolden, Pa.
- PEERLESS—wood polish, Foskett & Co., 226-228 La Salle St., Chicago, Ill.
- PEERLESS-V-BELT—motorcycle belts, The Peerless V-Belt Co., 215-219 S. Clinton St., Chicago, Ill.
- PELE—auto heaters, Automobile Heater Co., 1133 Broadway, N. Y. City.
- \*PEN-DAR—steel lockers & shop equipment, Edward Darby & Sons Co., Inc., 218 Arch St., Phila., Pa.
- PENINSULAR—ball-bearing cones, ball & socket joints, turn-buckles & taper pins, Peninsular Milled Screw Co., Champlain St. & Canton Ave., Detroit, Mich.
- PENINSULAR—grinders & countershafts, Peninsular Emery Wheel Co., Detroit, Mich.
- PENN—gasoline auto motors, Chester Engineering & Machine Co., Front & Penn Sts., Chester, Pa.
- PENN—grips, J. W. Grady & Co., 68 High St., Worcester, Mass. (Mfrs. Agents).
- PENNSYLVANIA—automobile & bicycle tires, Pennsylvania Rubber Co., Jeannette, Pa.
- PENNSYLVANIA—black iron filler paints & rough stuff, Pennsylvania Black Filler & Paint Co., Williamsport, Pa.
- PENNSYLVANIA—motorcycle tires, Pennsylvania Rubber Co., Jeannette, Pa.
- PEQUOT—bilge pumps & gasoline marine motors, The New London Motor Co., New London, Conn.
- PERFECT—automobile jacks & supports, Wm. E. Pratt Mfg. Co., 91 Lake St., Chicago, Ill.
- PERFECT—auto tire cases, Wm. H. Wiley & Son Co., Box 78, Hartford, Conn.
- PERFECT—curtain fasteners, C. Cowles & Co., Water & Chestnut Cts., New Haven, Conn.
- PERFECT—machinists' & pipe vises, Massey Vise Co., 9-11 W. Michigan St., Chicago, Ill.
- PERFECT—oil cups, H. B. Sherman Mfg. Co., 12 Barney St., Battle Creek, Mich.
- PERFECT—power hammers, Macgowan & Finigan Foundry & Machine Co., St. Louis, Mo.
- PERFECT—timers, drop brakes & air couplings, Youse & Daddow, 46 N. 5th St., Reading, Pa.
- PERFECT—top dressing, Jas. W. Cumber Co., 2900 E. 34th St., Cleveland, O.
- PERFECT—vehicle washers, Perfect Mfg. Co., 189 Circular St., Saratoga Springs, N. Y.
- PERFECT HANDLE—screw drivers, wrenches & machinists' hammers, H. D. Smith & Co., Plantsville, Conn.
- PERFECTION—anti-skid device, Baum's Brass & Model Works, 244 Third Ave., S., Minneapolis, Minn.
- PERFECTION—anti-skid devices, Perfection Non-Skid Climber Co., Edon, O.
- PERFECTION—automobile clocks & timers, Perfection Mfg. Co., 939 Stewart Ave., Cleveland, O.
- PERFECTION—body springs, The Perfection Spring Co., 2414 Superior Ave., N. W., Cleveland, O.

- \*PERFECTION—comb. priming & relief cocks, spark plug keys & funnels, Perfection Supply Co., Detroit, Mich.
- PERFECTION—crank hangers, bicycle tires & spokes, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- PERFECTION—curtain fasteners, automobile hardware, top trimmings, robe rails, foot rests, extra tire holders & auto lamp brackets, Metal Stamping Co., 30-50 Hubert St., N. Y. City.
- \*PERFECTION—electric lighting systems, auto & boat lighting outfits, Bishop, Delano & Co., Hoin & Van Buren Sts., Chicago, Ill.
- PERFECTION—goggles, Spencer Optical Mfg. Co., 31 Maiden Lane, N. Y. City.
- PERFECTION—ignition batteries, lighting outfits, electric, Perfection Igniter Mfg. Co., 1093 Bedford Ave., Brooklyn, N. Y.
- PERFECTION—juvenile foot & hand propelled vehicles, Toledo Metal Wheel Co., Toledo, Ohio.
- PERFECTION—license tags, N. Stafford Co., 67 Fulton St., N. Y. City.
- PERFECTION—license tags, Automobile License Indicator Co., Lewisburg, Tenn.
- PERFECTION—magnetos & battery chargers, The Economy Mfg. Co., Park Bldg., Pittsburgh, Pa.
- PERFECTION—marine gasoline motors, Caille Perfection Motor Co., 1300-30 Second Ave., Detroit, Mich.
- PERFECTION—moldings for dash & running boards, Jos. N. Smith & Co., Fourth & Porter Sts., Detroit, Mich.
- PERFECTION—oil & grease, Crew-Levick Co., 2231 Land Title Bldg., Phila., Pa.
- PERFECTION—oil soap & metal polish, The German Chemical Supply Co., 1565 Merwin Ave., Cleveland, Ohio.
- PERFECTION—overhead vehicle washers, Ryan & Long, Appleton, Wis.
- PERFECTION—parting & facing compounds & bronze & brass flux, Stanley Doggett, 101 Beekman St., N. Y. City.
- PERFECTION—pump connections, Stevens & Co., 375 Broadway, N. Y. City.
- \*PERFECTION—reversing gears for motor boats, Perfection Reversing Gear & Supply Co., 45 Vesey St., N. Y. City.
- PERFECTION—spring winder, Remington Tool & Machine Co., 50 Congress St., Boston, Mass.
- PERFECTION—universal joints, T. F. Gerome, 130-32 W. 18th St., N. Y. City.
- PERFECTION—weldless chains, Bridgeport Chain Co., Bridgeport, Conn.
- PERFECTION—wheel pullers, Empire Wheel Works, 172 South St., Utica, N. Y.
- PERFECTION—wind shields, M. P. Flanders, 61 Main St., Merrimack, Mass.
- PERFECTION—wrenches, Perfection Wrench Co., 18 N. Main St., Port Chester, N. Y.
- PERFECTION PINK—sheet packing, Hamilton Rubber Mfg. Co., Trenton, N. J.
- PERFECTO—battery connections, Geo. W. Bolton, 260 Wreford Ave., Detroit, Mich.
- \*PERFECTO—goggles, Alfred Levin, 134 E. 25th St., N. Y. City.
- PERFECTO—grease, Warren Lubricant Co., Buffalo, N. Y.
- PERFECTO—screw drivers, Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
- PERFEX—waterproof ignition systems, spark coils, timers & switches, Electric Goods Mfg. Co., Canton, Mass.
- PERKINS—presses, punches, shears & bending & straightening rolls, Perkins Machine Co., Warren, Mass.
- PERKINS—wind shields, A. D. Perkins, 315-317 E. 33d St., Los Angeles, Cal.
- PERMANENT BLACK—sheet packing, Hamilton Rubber Mfg. Co., Trenton, N. J.
- PERMANITE—packing, H. W. Johns-Manville Co., 100 William St., N. Y. City.
- PERRETZ—clear lighters, inspection lamps & wind shields, Chicago Wind Shield Co., 2235 Johnson St., Chicago, Ill.
- PERRY—anti-skid chains, Perry Chain Grp Co., Lansing, Mich.
- PERSAN-BEAUMONT—auto springs, imported by Lavalette & Co., Stoddard-Dayton Bldg., N. Y. City.
- PERSONS—belt fasteners, Majestic Mfg. Co., Worcester, Mass. (Mfrs. Agts.)
- PERSONS' PULLEY RIMS—motorcycle seats, Persons Mfg. Co., 54-68 Blomington Rd., Worcester, Mass.
- PETERSON—valve lifters, The Peterson Valve Lifter Co., 719 W. Jefferson St., South Bend, Ind.
- PETER UNION—motorcycle tires, N. S. U. Motor Co., 206 W. 76th St., N. Y. City.
- \*PETITE—switches & brake ratchets, American Motor Works, 87 N. Division St., Grand Rapids, Mich.
- PEUGEOT—cycle motors, Imported by Prospect Motor Co., 1900 Broadway, N. Y. City.
- PEUGOT—chains, imported by National Sales Corporation, 232 W. 58th St., N. Y. City.
- PFANSTIEHL—coils, Pfanstiehl Electrical Laboratory, North Chicago, Ill.
- PHELPS—spark gaps, The New England Sales Co., 454 Old South Bldg., Boston, Mass.
- \*PHELPS VEHICLE RECORDER—meters, Wm. S. Jones, 3038 Chestnut St., Phila., Pa.
- PHENIX—brass & bronze tubes & brazed steel tubing, Phenix Tube Co., 182 N. 11th St., Brooklyn, N. Y.
- PHENIX—shock absorbers, imported by Panhard & Levassor, Broadway & 62nd St., N. Y. City.
- PHILADELPHIA—grease, Philadelphia Grease Mfg. Co., 848-850 S. Swanson St., Phila., Pa.
- PHILADELPHIA—grease cups, Philadelphia Lubricator & Mfg. Co., The Bourse, Phila., Pa.
- PHILADELPHIA—slat irons & curtain silk, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- PHILADELPHIA—wind shields, Harry C. Cranmer, 217 S. 24th St., Phila., Pa.
- PHILIPS—split pulleys, Philips Pressed Steel Pulley Works, N. E. cor. 4th & Glenwood Ave., Phila., Pa.
- PHILLIPS—gasoline marine & automobile motors & electric auto charging apparatus, Phillips Gasoline Engine & Motor Co., Washington Blvd. & Clinton St., Chicago, Ill.
- PHILLIPS—timers, Harder's Mfg. Co., 40th St. & Calumet Ave., Chicago, Ill.
- PHOEBUS—acetylene & oil lamps for autos, acetylene gas generators & lamp brackets, Manhattan Screw & Stamping Works, 67th St. & West End Ave., N. Y. City.
- PHOENIX—bit braces, machinists' clamps, vises, lathe dogs & anvils, Phoenix Hardware Mfg. Co., Homer, N. Y.
- PHOENIX—fire extinguishers, Phoenix Fire Apparatus Co., 43 W. 34th St., N. Y. City.
- PHOENIX—gasoline savers, Herz & Co., 203-205 Lafayette St., N. Y. City.
- PHOENIX—tire irons & presses, wheel pullers & valve lifters, automobile tops, auto lamp covers & storage ignition batteries, Phoenix Auto Supply Co., 3974-76 Olive St., St. Louis, Mo.
- PHOENIX—vises, machinists' clamps, anvils, lathe dogs & bit braces, Phoenix Hardware Mfg. Co., Homer, N. Y.
- PHOENIX METAL—bearing metal, National Lead Co., 111 Broadway, N. Y. City.
- PHOENIXO—gear case lubricant, Fiske Bros. Refining Co., 24 State St., N. Y. City.
- PICK-UP—wrenches, New Britain Mfg. Co., New Britain, Conn.
- PIERCE—auto leather pillows (mfrs. agt.), Hayne-Surridge Co., 1017 Lucas Ave., St. Louis, Mo.
- PIERCE—gasoline motor boats, The Pierce Motor Co., Racine, Wis.
- PIERCE—heaters, wrenches & wind shields, Geo. W. Pierce Co., 2203 S. Main St., Anderson, Ind.
- PIG—vulcanizers, The J. M. Padgett Co., 118 E. 7th St., Topeka, Kan.
- PIGGINS—clutches, Piggins Bros., Racine, Wis.
- PIGNON—magnetos, Imported by The Motor Car Equipment Co., 55 Warren St., N. Y. City.

- \*PILLINER—tire tool, N. A. Petry, 422 Commerce St., Phila., Pa.
- PIONEER—bow sockets, body irons, bow separators, curtain fasteners, top fixtures, auto hardware & upholstery buttons, Crandal, Stone & Co., Binghamton, N. Y.
- \*PIONEER—cements, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, Ohio.
- PIONEER—cement, leather, Van Cleef Bros., 7711 Woodlawn Ave., Chicago, Ill.
- PIONEER—grease injectors, Standard Sheet Metal Co., Delaware Ave., Passaic, N. J.
- PIONEER—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.
- PIONEER—portable vises, Schuchardt & Schutte, 90 West St., N. Y. City.
- PIONEER—valve grinding tools, electric drills & buffing tools, Valve Seating Tool Co., Bridgeport, Conn.
- PIQUA—molders' & automobile shovels, Wood Shovel & Tool Co., Piqua, Ohio.
- PIRELLI—cable, imported by The Motor Car Equipment Co., 55 Warren St., N. Y. City.
- PIRELLI—ignition cable, imported by National Sales Corporation, 232 W. 58th St., N. Y. City.
- PITNER—pumps & pump connections, D. H. Lawrence Co., Sterling, Ill.
- PITTS—tire chains, Pitts Anti-Skid Chain Co., 2422 Michigan Ave., Chicago, Ill.
- PITTSBURG—fire extinguishers, Safety Fire Extinguisher Co., 29-33 W. 42nd St., N. Y. City.
- \*PITTSBURG—heaters, garage, Pittsburg Water Heater Co., Pittsburg, Pa.
- PITTSBURG—pneumatic tools, Pittsburg Pneumatic Co., 90 West St., Canton, Ohio.
- PITTSBURG—valves, Pittsburg Gage & Supply Co., 30th & Liberty Sts., Pittsburg, Pa.
- PITTSBURGH—vises, The Pittsburgh Automatic Vise & Tool Co., Pittsburg, Pa.
- PITTSFIELD—switches, timers, magnetos, sparking coils, terminals & distributors, Pittsfield Spark Coil Co., Dalton, Mass.
- \*PIVOT AUTO LIGHT—lamp brackets, The Pivot Auto Light Co., 68 Post St., San Francisco, Cal.
- PIXLEY—carburetors, Geo. H. Pixley Co., 30 Huntington Ave., Boston, Mass.
- \*PLANCH—gasoline cycle motors, Motor Car Specialty Co., Lamberton & Lalor Sts., Trenton, N. J.
- PLANET—auto tool rolls, The Planet Co., Westfield, Mass.
- PLANHARD—carburetors, Planhard Mfg. Co., Kokomo, Ind.
- PLANTE—positive plates for vehicle batteries, Westinghouse Storage Battery Co., Boonton, N. J.
- PLATA METAL—bearing metal, Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.
- PLUG-LEAK—metal cements, Hazen-Brown Co., 100 South St., Boston, Mass.
- PLUG UMBRELLA—spark plug protectors, Plug Umbrella Co., 70 Long Wharf, Boston, Mass.
- PLUNKET—machine tool vises, J. E. Plunket, 1342 W. Lake St., Chicago, Ill.
- PLUNKET, JR.—stationary engines, J. E. Plunket, 1342 W. Lake St., Chicago, Ill.
- PLURALITY DIE—bolt & nut machinery, Mummert, Wolf & Dixon Co., Hanover, Pa.
- PLUTO CEMENT—tire cements, Hazen-Brown Co., 100 South St., Boston, Mass.
- PLUVIUSIN—imitation leather, imported by Chas. R. Silkman, 111 Duane St., N. Y. City.
- POCONO—babbit metal, The Tanite Co., Stroudsburg, Pa.
- THE POINT—spark plugs & spark gaps, The Point Spark Plug Co., 112-114 11th Ave., S. E. Aberdeen, S. D.
- POLARINE—oils & greases, Standard Oil Co., Inc., Room 609, 26 Broadway, N. Y. City.
- POLAR WAVE—anti-freezing solutions, Benjamin Gerdelman Mfg. Co., 4630 Olive St., St. Louis, Mo.
- POLDI—high speed twist drills, Peter Frasse & Co., 130-32 Worth St., N. Y. City.
- POLISHINE—metal polish, Cleaner Mfg. Co., 2842 Olive St., St. Louis, Mo.
- POLSON—bumpers, foot & robe rails, jacks, tire holders, tire tools, valve lifting tools, wind shields & wheel pullers, W. F. Polson, 27 Chenango St., Buffalo, N. Y.
- POMPE VADAM—tire inflators & tire inflating tanks, imported by Rex Tire Co., 138 W. 68th St., N. Y. City.
- PONTOSUC—auto blankets, Pontosuc Woolen Mfg. Co., Pittsfield, Mass.
- \*POPE—gasoline motor boats, Pope Boat Co., Fond du Lac, Wis.
- POPE DAILY SERVICE—bicycles, The Pope Mfg. Co., Hartford, Conn.
- POPE'S ISLAND—brass & bronze castings, Le Compte Mfg. Co., 119 Chambers St., N. Y. City.
- POROX—ignition batteries, Albert Muller, 145 W. 49th St., N. Y. City.
- PORTABLE BABY—tire inflating tanks, Liquid Carbonic Co., 67 Wells St., Chicago, Ill.
- PORTAGE—gasoline marine motors, Portage Boat & Engine Co., 105 Mullet St., Portage, Wis.
- PORTLAND—turntables & chauffeur's trucks, Portland Garage, Portland, Me.
- POSITIVE—grease cups, The Lunkenheimer Co., Cincinnati, O.
- \*POST'S—piston ring clamps, E. L. Post, 50 Cliff St., N. Y. City.
- POWCO—fan, pump & oiler belts, Philadelphia Steel & Wire Co., 525 Commerce St., Phila., Pa.
- POWELL—exhaust mufflers for gasoline engines, Powell Muffler & Timer Co., Utica, N. Y.
- \*POWELL—gasoline marine motors, The Powell Engine Corporation, 49 Warren St., N. Y. City.
- POWER—spark plugs, Motor Car Equipment Co., 55 Warren St., N. Y. City.
- PRAY—apron fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- PRECISION—leather fillets, Cleveland Galvanizing Works Co., 18-24 Cooper St., Cleveland, O.
- PRECISION—milling machines, Lucas Machine Tool Co., Cleveland, Ohio.
- \*PREMIER—gasoline marine motors, The Wittmaack Machine Co., Leib & Wight Sts., Detroit, Mich.
- PREMIER—lubricators, The Lunkenheimer Co., Cincinnati, O.
- PREMIER—screw drivers, The Cassady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- PREMIER WOVEN TOP—cushion springs, Detroit Wire Spring Co., 21st & Standish Sts., Detroit, Mich.
- PREMIUM—grease cups, H. B. Sherman Mfg. Co., 12 Barney St., Battle Creek, Mich.
- PREMIUM—oils & greases, Keystone Oil & Supply Co., Inc., Pittsburg, Pa.
- PRENTISS—vises, Prentiss Vise Co., 44 Barclay St., N. Y. City.
- \*PRESCO—spark plug brushes, Pres Manufacturing Co., 6006 Olive St., N. E., Cleveland, O.
- PRESTEEL—frames, running boards, sprockets, stampings, dies, tools, axle housings & transmission cases, Detroit Pressed Steel Co., 1800 Mt. Elliott St., Detroit, Mich.
- PRESTO—acetylene lamp adapters, R. E. Dietz Co., 60 Lighthouse St., N. Y. City.
- PRESTO—battery connectors, Auto Accessory Co., 75 Florence St., Worcester, Mass.
- PRESTO—chucks, collets & friction tapping devices, The Whitney Mfg. Co., Hartford, Conn.
- \*PRESTO—cigar lighters, Hercules Auto Specialty Mfg. Co., Chicago, Ill.
- PRESTO—cigar lighter & lamp combined & incandescent repair lamps, Metal Specialties Mfg. Co., 427-441 W. Randolph St., Chicago, Ill.
- PRESTO—cross chains & hooks, Newhall Chain Forge & Iron Co., 90 West St., N. Y. City.
- PREST-O-CARBON REMOVER—The Prest-O-Lite Co., 229-237 E. South St., Indianapolis, Ind.

PRESTOLINE—metal polish, W. H. Cross & Ladd Co., 29 Murray St., N. Y. City.  
 PREST-O-LITE—gas tanks, tire inflating tanks & soft rubber tubing, Prest-O-Lite Co., 229-237 E. South St., Indianapolis, Ind.  
 PRESTOSHINE—metal polish, W. S. Sheppard, 22 Lawrence St., Newark, N. J.  
 PRESTON—tires, Preston Fabric Tire Co., 1410 Niagara St., Buffalo, N. Y.  
 PRICE—auto gloves, Fried-Ostermann Co., Rockford, Ill.  
 PRIMUS—oil & grease, Penn Petroleum Co., 117 N. 2nd St., Phila., Pa.  
 PROTECTION BRAND—asphalt roofing, Asphalt Ready Roofing Co., 136 Water St., N. Y. City.  
 PROTECTOR X—lamp guards, Crescent Co., Valparaiso, Ind.  
 PROTECTO—tire protector, American Tire Co., Owosso, Mich.  
 PROTEX—raincoats, Trans-Atlantic Mercantile Co., 172 Fifth Ave., N. Y. City.  
 PROVIDENCE—pipe vises, General Fire Extinguisher Co., Providence, R. I.  
 PUCK—switches, Herz & Co., 203-205 Lafayette St., N. Y. City.  
 PUGH—auger bits, Job T. Pugh, 31st & Ludlow Sts., Phila., Pa.  
 PULLET—countershafts & belt shifters, factory, The L. & D. Co., 88 Broad St., Boston, Mass.  
 PULL-PUSH—battery connections, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.  
 PUMPELLY—vehicle & ignition batteries, Pumpelly Battery Co., 1202-12 E. 22nd St., Indianapolis, Ind.  
 PUP—ignition batteries, Chicago Battery Co., 2600-10 Wabash Ave., Chicago, Ill.  
 PURITAN—files & rasps, Colonial File Co., 167-70 Teneau St., Neponset, Mass.  
 PURITAN—foot rests, The S. M. Supplies Co., 22-24 Lincoln St., Boston, Mass.  
 PURITAN—gasoline automobile engines, transmission gears, circulation pumps, gears and posts, Puritan Machine Co., 72-74 Brush St., Detroit, Mich.  
 \*PURITAN—gas tanks for lamps and tire inflating tanks, Puritan Gas Tank Co., Room 642, Old South Bldg., Boston, Mass.  
 PURITAN—metal polish & auto body soap, Davey & Co., 2600-2608 Grand Ave., Chicago, Ill.  
 PURITAN—switches, ignition, Frank W. Morse, 516 Atlantic Ave., Boston, Mass.  
 PURO—rim shellac, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.  
 \*PUTNAM—timers, The K & T Mfg. Co., 32 Atlantic Ave., Boston, Mass.  
 PUTZADE—metal polish, W. H. Cross & Ladd Co., 29 Murray St., N. Y. City.  
 PUTZ—metal polish, W. H. Cross & Ladd Co., 29 Murray St., N. Y. City.  
 PUTZ POMADE—metal polish, J. C. Paul & Co., 59 Dearborn St., Chicago, Ill.  
 PYKO—hand & foot grinders, Pike Mfg. Co., Pike, N. H.  
 PYRALIN—transparent sheeting, The Arlington Co., 725-27 Broadway, N. Y. City.  
 PYRAMID—aluminum floor covering, Factory Sales Corporation, 1438 Michigan Ave., Chicago, Ill.  
 PYRAMID—aluminum matting, Metallic Automobile Matting Co., Box 555, Rochester, N. Y.  
 PYRENE—fire extinguishers, M. L. Snyder, 9 N. 4th St., Phila., Pa.  
 PYRO—camping outfit, The Alcohol Utilities Co., 156 W. 23rd St., N. Y. City.  
 PYRO—denatured alcohol, U. S. Industrial Alcohol Co., 100 William St., N. Y. City.  
 PYRO—water solution hydrometers, Taylor Instrument Companies, Rochester, N. Y.

Q

QUAKER CITY—rubber hose, Quaker City Rubber Co., 629 Market St., Phila., Pa.

QUALITY—automobile tops, covers, body upholstery & auto blacksmithing, wind shields & tool boxes, F. W. Anderson & Co., Brown & Uber Sts., Phila., Pa.  
 QUALITY BRAND—motor boat paints, Carpenter-Morton Co., Boston, Mass.  
 QUEEN CITY—shapers, Queen City Machine Tool Co., N. W. Cor. Sycamore & Webster Sts., Cincinnati, O.  
 QUEER CREEK—oilstones, Pike Mfg. Co., Pike, N. H.  
 QUICK ACTION—battery connections, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.  
 QUICK ACTION—motorcycle stands, luggage carriers, tandem attachments, motorcycle repair pedals & watch holders, Henry T. Adams Co., 6823 S. Chicago Ave., Chicago, Ill.  
 QUICK ACTION—sparking & primary coils, magnetos & switches, spark plugs, dynamos, battery connections & cigar lighters, The Knoblock-Heideman Mfg. Co., South Bend, Ind.  
 QUICKFIRE—spark plugs, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.  
 QUICK-KLEAN—hand cleansing compound, Frost, Stamp & Stationery Co., 505 Main St., Worcester, Mass.  
 QUICK-LIFT—automobile jacks, Covert's Saddlery Works, Interlaken, N. Y.  
 QUICK-OUT—fire extinguishers, Royal Mfg. Co., Lancaster, Pa.  
 QUICK-TITE—inner tube patches, The Quick-Tite Patch Co., Amsterdam, N. Y.  
 QUIRDE—metal gears, flexible washers, differential gears & speed change gears, Quirde Co., 1417 N. Salina St., Syracuse, N. Y.

R

R B F—ball bearings imported by International Engineering Co., of N. J., 1779 Broadway, N. Y. City.  
 R. I. V.—automobile ball bearings, R. I. V. Co., 1771 Broadway, N. Y. City.  
 R. R.—metal polishes, 3-in-One Oil Co., 42 Broadway, N. Y. City.  
 R. R. R.—radiator rust removers, Hazen-Brown Co., 100 South St., Boston, Mass.  
 R-S—motorcycle tandem attachments, motor tricycles, delivery vans & motorcycle luggage carriers, Reading Standard Co., Reading, Pa.  
 R & V—stationary gas, gasoline & distillate engines, The Root & Van Dervoort Engineering Co., East Moline, Ill.  
 R & W—chauffeur suits & auto dusters, Rosenevald & Weil, Inc., Franklin, Congress & Market Sts., Chicago, Ill.  
 RACINE—attachable match flare, John Dean Mfg. Co., Racine, Wis.  
 RACINE—gasoline motor boats & marine engines, steam motor boats and marine engines, Racine Boat Mfg. Co., Muskegon, Mich.  
 RACINE—power hack saws & hack saw blades, Racine Gas Engine Co., Racine Junction, Wis.  
 RACINE—stationary & marine steam engines, Racine Engine & Machinery Co., Racine, Wis.  
 THE RACINE—tops, lamp covers, tire cases & wind shields, Racine Buggy Top Co., 13th & Clark Sts., Racine, Wis.  
 RACYCLE—bicycles, Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.  
 RADERMACHER'S—cushion springs, John L. Radermacher, 16 Horatio St., N. Y. City.  
 RADICAL—chucks & drilling machines for boring square holes, Radical Angular Drill & Tool Co., 119 W. 23rd St., N. Y. City.  
 RADIO—heaters & metal polish, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.



- RADIO-COOLER—radiator compounds, Elder Mfg. Co., Indianapolis, Ind.
- RADIOFLEX—electric auto lamps, Electro Importing Co., 86 W. Broadway, N. Y. City.
- RADIUM—ignition batteries, anti-skid chains, magnetos, mufflers, bumpers & current indicators, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.
- RADIUM—ignition batteries, Stackpole Battery Co., St. Marys, Pa.
- RADIUM—metal polishes, The Bobrick Chemical Co., 111-117 S. Garey St., Los Angeles, Cal.
- RADU—lock switches, Radu Surgical Instrument Co., 20 Builders' Exchange, Buffalo, N. Y.
- RAFLEX—spark plugs, Raflex Ignition Co., 2124 E. 2nd St., Cleveland, Ohio.
- RAHN-CARPENTER—lathes, The Rahn-Carpenter Co., Cincinnati, Ohio.
- RAINO—waterproof auto & nautical clothing & robes, The Raino Co., 1828-30 S. Halsted St., Chicago, Ill.
- RAJAH—spark plugs, terminals, spark plug hoods and nipples, gaskets & porcelain insulation, Rajah Auto Supply Co., Bloomfield, N. J.
- RALACO—gasoline marine motors, S. M. Jones Co., 600 Segur Ave., Toledo, Ohio.
- RAMBLER—bicycles, The Pope Mfg. Co., Hartford, Conn.
- \*RAMSEY—gasoline marine engines, Ramsey Mfg. Co., 486 Bullitt Bldg., Phila., Pa.
- RANKIN—automobile dome lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- RAPID—cleansing compounds, auto body, T. K. Shannon, Hartford, Conn.
- \*RAPIDCUT—valve grinding compound, Essex Mfg. & Supply Co., Newark, N. J.
- RAPID FIRE—dry batteries, Nungesser Electric Battery Co., 27-33 King St., Cleveland, O.
- RAPID FIRE—spark coils & switches, Tritt Electric Co., Union City, Ind.
- RAPID FIRE—spark plugs, National Steel Products Co., Lorain, O.
- RAPID FIRE—whistles & whistle outfits, motor boat, electric, The Russell Electric Co., Danbury, Conn.
- RARITAN—dome lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- RASCO—twin gasoline strainer—auto & marine, Oscar Schoge, 1211 Jefferson Ave., Brooklyn, N. Y.
- RATIONAL—exhaust car heaters, Motor & Mfg. Works Co., Foot of Middle St., Geneva, N. Y.
- RAVEN BRAND—insulating tapes, New York Insulated Wire Co., 114 Liberty St., N. Y. City.
- RAVES—distributors & timers, Mica Core Mfg. Co., 442 E. 166th St., N. Y. City.
- RAYBESTOS—brake linings, The Royal Equipment Co., 414-32 Housatonic Ave., Bridgeport, Conn.
- RAYDO—metal polish and wood polish, Ulrich & Co., 227-233 E. North St., Buffalo, N. Y.
- RAYFLEX—portable electric lights, Standard Sheet Metal Co., Delaware Ave., Passaic, N. J.
- RAYMOND—automobile clothing, A. Raymond & Co., Nassau & Fulton Sts., N. Y. City.
- RAYMOND—brakes and complete equipments, The Royal Equipment Co., 414-32 Housatonic Ave., Bridgeport, Conn.
- RAYMOND—clip non-skid chains, Raymond & Co., 331 Michigan Ave., Chicago, Ill.
- READ—terminals, Henry R. Read, 45 Kingston Ave., Brooklyn, N. Y.
- READING STANDARD—bicycles, Reading Standard Co., Reading, Pa.
- READRITE—pocket battery meters and switchboard meters, Read-Rite Meter Wks., 14 Main St., Bluffton, Ohio.
- RECOMETRE—speed indicator and odometers, Recometre Co. of America, 2120 Broadway, N. Y. City.
- RECORD—side lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- RECORD—spark coils, spark plugs, magnetos & timers, Nilson-Miller Co., 13th & Hudson Sts., Hoboken, N. J.
- RECTI—electric auto bells, Edwards & Co., Inc., 14th & Exterior Sts., N. Y. City.
- RED—cans, buckets & tanks, Wallman Mfg. Co., 283-285 5th Ave., Milwaukee, Wis.
- RED CROSS—auto oils & greases, metal polishes & auto body cleansing compounds, Auto Oil Co., 172 S. Water St., Jackson, Mich.
- \*RED CROSS—cements, brazing forges, enamels, cycle vulcanizers, enameling ovens, tire repair tape, chain & gear grease, brazing compounds, National Cement & Rubber Mfg. Co., 3053-3059 Monroe St., Toledo, O.
- RED CROSS—spark plugs, Autoiote Mfg. Co., 26 Warren St., N. Y. City.
- RED CROSS—spark plugs, Blake Electrical Co., 88 Purchase St., Boston, Mass.
- RED DEVIL—vibrators, New Britain Mfg. Co., New Britain, Conn.
- RED-E—tool holders, Ready Tool Co., New Haven, Conn.
- RED HEAD—spark plugs, Emil Grossman Co., 232 W. 58th St., N. Y. City.
- RED RIB—ignition wire, Emil Grossman Co., 232 W. 58th St., N. Y. City.
- RED SEAL—dry batteries, Manhattan Electrical Supply Co., 17 Park Place, N. Y. City.
- RED SEAL—paints, Detroit Varnish Co., Detroit, Mich.
- RED SHIELD AUTO—ignition batteries, Wesco Supply Co., 7th & Clark Ave., St. Louis, Mo.
- REDSKIN—gasoline chassis, auto wheels, lock nuts, brake & speed change levers, Jamesville Mfg. Co., Jamesville, N. Y.
- RED STAR—ignition batteries, dry, White Star Battery Co., 126 Chambers St., N. Y. City.
- RED STAR—tool steel, Colonial Steel Co., Pittsburg, Pa.
- RED TOP—burners, acetylene gas, J. H. McCullough & Son, 219 N. Broad St., Phila., Pa.
- RED TOP—ignition batteries, National Carbon Co., Lock Drawer "L," Cleveland, O.
- RED WING—gasoline motor boats and motors, Red Wing Boat Mfg. Co., Red Wing, Minn.
- REECE—screw plates, stocks & dies, E. F. Reece Co., Greenfield, Mass.
- REECE—taps & dies, Butterfield & Co., Derby Line, Vt.
- REED—lathes, F. E. Reed Co., 122 Gold St., Worcester, Mass.
- REED—pliers, Reed Mfg. Co., Erie, Pa.
- REEVES—gasoline automobile engines, bearing metal, variable speed transmissions, wood split pulleys and pulley clutches, Reeves Pulley Co., Columbus, Ind.
- REEVES—white brass, Paul S. Reeves & Son, 1415 Catharine St., Phila., Pa.
- REEVES DIAMOND—phosphor bronze ingots, wire, rods, sheets, etc., & phosphor copper, Paul S. Reeves & Son, 1415 Catharine St., Phila., Pa.
- REFINED—gasoline marine motors & carburetors, Thrall Motor Co., 35 Fort St., E., Detroit, Mich.
- REFLEX—storage ignition batteries & spark plugs, The Reflex Ignition Co., 6919 Lexington Ave., Cleveland, O.
- REGAL—oil auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.
- REGENT—auto tires, Regent Tire Co., 3313-15 Troost Ave., Kansas City, Mo.
- REGIMENT—bicycle tires, New York Sporting Goods Co., 17 Warren St., N. Y. City. (Jobbers.)
- REGINA—packing, Crandall Packing Co., Palmyra, N. Y.
- REICHERT—taximeters, Naughton-Mulgrew Taximeter Cab Co., 153-157 E. 53d St., N. Y. City.
- REID—drill chucks, R. H. Brown & Co., New Haven, Conn.
- REID RATIONAL—under water exhausts, The Motor & Mfg. Works Co., Foot of Middle St., Geneva, N. Y.



- REID'S PUTZ & REID'S PUTZ POMADE—metal polish, W. W. Reid Mfg. Co., 131 State St., Boston, Mass.
- REINDEER—bicycles and tires, New York Sporting Goods Co., 17 Warren St., New York City. (Jobbers.)
- RELIABLE—anti-skid devices, The Auto Chain Repair Co., 1428 Wabash Ave., Chicago, Ill.
- RELIABLE—automobile jacks & car supports for garages, Elite Mfg. Co., Ashland, O.
- RELIABLE—curtain fasteners, Jos. N. Smith & Co., 4th & Porter Sts., Detroit, Mich.
- RELIABLE—cylinder oil, cutting compounds & auto body soap, General Oil Works Co., Traction Bldg., Indianapolis, Ind.
- RELIABLE—hand auto tire pumps, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- RELIABLE—ignition batteries, The Storage Battery Supply Co., 239 E. 27th St., New York City.
- RELIABLE—magnetos, Reliable Electric Mfg. Co., Box 244, Indianapolis, Ind.
- \*RELIABLE—priming valve, J. H. Koontz & Co., Culver, Ind.
- RELIABLE—radiators, Reliable Radiator Co., Inc., 451 E. 173rd St., N. Y. City.
- RELIABLE—tailboard fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- RELIABLE—torches, soldering furnaces & gasoline paint burners, Schneider & Trencamp Co., E. 40th St. & Penna. R. R., Cleveland, Ohio.
- RELIABLE—water gauges, Reliable Water Gauge Co., 1616 Pine St., St. Louis, Mo.
- RELIABLE—wrenches, taps & dies, Conant & Donelson, Greenfield, Mass.
- RELIABLE GEARAIID—gear oil, General Oil Works Co., Traction Bldg., Indianapolis, Ind.
- RELIAANCE—ammeters, voltmeters & volt-ammeters, Reliance Instrument Co., 527 W. Van Buren St., Chicago, Ill.
- RELIAANCE—ammeters, The Post & Lester Co., 20 Sargeant St., Hartford, Conn.
- RELIAANCE—bicycles, Gendron Wheel Co., Toledo, O.
- RELIAANCE—constant speed electric motors for driving machinery, The Reliance Electric & Engineering Co., Caxton Bldg., Cleveland, Ohio.
- \*RELIAANCE—files & rasps, Johnson & Bros., File Co., Newark, N. J.
- RELIAANCE—fire extinguishers, Charles Edmund Grubb, 819 Fourth Ave., Altoona, Pa.
- RELIAANCE—ignition batteries, The Storage Battery Supply Co., 239 E. 27th St., N. Y. City.
- RELIAANCE—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- RELIAANCE—pliers, Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn.
- RELIAANCE—spark plugs, Jeffery-Dewitt Co., 217-219 High St., Newark, N. J.
- RELIAANCE—speed indicators, Reliance Speedmeter Co., 134 Eliot St., Boston, Mass.
- REMINGTON—kerosene motor boat engines & stationary engines, Remington Oil Engine Co., 700 Pacific St., Stamford, Conn.
- REMY—magnetos, Remy Electric Co., Columbus Ave. & 25th St., Anderson, Ind.
- RENEWO—misc. valves, The Lunkenheimer Co., Cincinnati, O.
- RENO—French umber filler, Reno Bros. Paint Co., Pulaski, Pa.
- RENOLD—auto chains, Link-Belt Co., Hunting Park Ave. & Reading Ry., Nicetown, Phila., Pa.
- RENSHAW—ratchet drills, Pratt & Whitney, 111 Broadway, N. Y. City.
- REPUBLIC—tires, auto, Republic Rubber Co., Youngstown, Ohio.
- RESERVE—oil cups, auto, rhe Lunkenheimer Co., Cincinnati, O.
- RESERVE—storage ignition batteries, Westinghouse Storage Battery Co., Boonton, N. J.
- RESUME—electric auto lamps, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- REVIEW—dome lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- REV-O-NOO—tire repair tools, Hibbard, Spencer, Bartlett & Co., Chicago, Ill.
- REX—automobile tool cases, lamp covers, robes, automobile capes, sleevelets, repair aprons & storm aprons, tire & tube cases, grease bags, gloves, wind shields, curtain rolls & auto covers, Rex Shield & Mfg. Co., Connersville, Ind.
- REX—auto tires, Rex Tire Co., 138 W. 68th St., N. Y. City.
- REX—cup grease, Marshall Oil Co., Marshalltown, Iowa.
- REX—files & rasps, Rex File & Saw Co., Newcomerstown, Ohio.
- REX—fire extinguishers, The Rex Fire Extinguisher Co., 72-76 Cortlandt St., New York City.
- REX—foot rests, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- REX—grease cups, The Lunkenheimer Co., Cincinnati, O.
- REX—hand soap, C. I. Nesmith Co., Reading, Mass.
- REX—metal polish, Armiger Chemical Co., 2155-57 Austin Ave., Chicago, Ill.
- REX—pump connections, Stevens & Co., 375 Broadway, N. Y. City.
- \*REX—tire powder, Rex Mfg. Co., Hartford, Conn.
- REX—vises, Prentiss Vise Co., 44 Barclay St., N. Y. City.
- REX—wrenches, Rex Wrench Co., Boston, Mass.
- REXINE—hand & auto body cleansing compounds, The Rexine Co., 725 New York Ave., Sheboygan, Wis.
- REX 4 WAY—goggles, Texas Co., 212-14 Kinzie St., W., Chicago, Ill.
- REYNOLDS—eye protectors & skid devices (for pulling out of mud holes), Harry H. Reynolds, 1205 Monadnock Block, Chicago, Ill.
- REYNOLDS—screw driving machines & gear cutting machinery, Reynolds Machine Co., Moline, Ill.
- RHENANIA—gear hobbing machines, Alfred H. Schutte, 90 West St., N. Y. City.
- RHINELAND—ball bearings, imported by Sulzemyer & Co., 50 Church St., N. Y. City.
- \*RHINELANDER—gasoline motor boats, Rhineland Boat Co., 251 Kemp St., Rhineland, Wis.
- RHOADES—unit sparker, The Altemus Mfg. Co., 42nd & Chestnut Sts., Phila., Pa.
- RHODES—tire remover, The Rhodes Mfg. Co., Grand Rapids, Mich.
- RHODES PATHFINDER—Route guides, automatic, The J. B. Rhodes Co., Kalamazoo, Mich.
- RICHARD POPP—taximeters, Franco-American Taximeter Co., 49th St. & 7th Ave., N. Y. City.
- RICHARDS—aluminum solder, Janney-Steinmetz & Co., 4th & Market Sts., Phila., Pa.
- RICHARDSON—boat lighting outfits, Richardson Engineering Co., 107 Liberty St., N. Y. City.
- RICH—drilling machines, flat drills, expanding mandrels, sockets, sleeves & chucks, Celfor Tool Co., Chicago, Ill.
- RICHMOND—air compressors, The Standard Pattern & Mfg. Co., Richmond, Ind.
- RICHMOND—auto dome lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- RICHMOND STANDARD—stationary engines, The Standard Pattern & Mfg. Co., Richmond, Ind.
- RIGHT—gaskets & rubber packing, The Gasket Supply Co., 1829 Ludlow St., Phila., Pa.
- RILEY—wind shields, extra tire holders & gasoline cycle motors, Riley Bros., Bridge-ton, N. J.
- RIMMON—side lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- RIPPLEY—galvanized steel motor boats, gasoline tanks, compressed air tanks & hulls, Rippley Steel Boat Co., Box O, Grafton, Ill.

- RISE SUN**—metal polish, Acme Polish Co., 810 Second Ave., Pittsburg, Pa.
- RIST-FIT**—gloves, Morrison-Ricker Mfg. Co., Grinnell, Iowa.
- RITTER**—spring winders, Macomber & Whyte Rope Co., 507-509 S. Clinton St., Chicago, Ill.
- RIVAL**—leather belting, Hudson Belting Co., 1-3 Eaton Pl., Worcester, Mass.
- RIVERSIDE**—speedometers, Excelsior Tire Co., 1777-79 Broadway, N. Y. City.
- ROBBINS & MYERS**—electric motors for driving machinery charging apparatus & dynamos, The Robbins & Myers Co., Springfield, Ohio.
- ROBERTS**—marine gasoline engines, Roberts Motor Co., Sandusky, O.
- ROBERT**—voltmeters, volt-ammeters, ammeters & current indicators, The Robert Instrument Co., 56 Shelby St., Detroit, Mich.
- ROBERTSON'S**—auto body soap, J. T. Robertson Co., Manchester, Conn.
- ROBERTSON'S RED CROSS BRAND**—metal polish, Robertson & Co., 1061 W. Madison St., Chicago, Ill.
- ROBESON**—glutrin for road making, Robeson Process Co., Au Sable Forks, N. Y.
- ROBINSON**—auto tops, top joints & auto trimmings, H. H. Robinson Mfg. Co., Des Moines, Iowa.
- ROBINSON'S**—drill & surface grinders & tool holders, Robinson Tool Works, Waterbury, Conn.
- ROCHESTER**—automobile lamp brackets, Thos. J. Northway, 92 Exchange St., Rochester, N. Y.
- ROCHESTER**—gasoline motor boats and marine engines, Rochester Gas Engine Co., 707 Driving Park Ave., Rochester, N. Y.
- ROCHESTER**—helve hammers, West Tire Setter Co., 143 Cutler Bldg., Rochester, N. Y.
- ROCHESTER**—locks for steering posts, The Rochester Safety Lock Co., Rochester, Ind.
- ROCHESTER**—lubricators, Greene, Tweed & Co., 109 Duane St., N. Y. City.
- \*ROCHESTER**—marine engines, Boston Gasoline Engine Co., 19 High St., Boston, Mass.
- ROCHESTER**—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- ROCH-O**—timers, Rochester Timer Co., Livingston Bldg., Rochester, N. Y.
- \*ROCK CRUSHER**—tire protectors, I. J. D. Fairhurst, Juda, Wis.
- ROCKFORD**—metal shapers & planers, Rockford Machine Tool Co., Rockford, Ill.
- ROCK**—solidified palm oil and transmission oil, Magie Bros., 9-11 N. Canal St., Chicago, Ill.
- ROCK ISLAND**—gray iron castings, machinists', woodworkers' & pipe vices, Rock Island Mfg. Co., Rock Island, Ill.
- ROCKWOOD**—friction drives, Rockwood Mfg. Co., 1911 English Ave., Indianapolis, Ind.
- ROGERS**—carbon removers & top dressing, Detroit Varnish Co., Detroit, Mich.
- ROGERS AUTO-BRASSHINE**—metal polish, eDetroit Varnish Co., Detroit, Mich.
- ROGERS AUTO-BRITE**, wood polish, Detroit Varnish Co., Detroit, Mich.
- ROGERS KLENZER**—auto body cleansing compound, Detroit Varnish Co., Detroit, Mich.
- ROGERS RED SEAL**—varnishes, Detroit Varnish Co., Detroit, Mich.
- ROHRBACHER**—tire inflators, pump & storage pumps, pump connections, nipple & nozzle for cleaning purposes and hose connections, Rohrbacher Automobile Air Pump Co., 173 East Water St., Portland, Ore.
- ROLLER SMITH**—ammeters, voltmeters & voltmeters, Roller-Smith Co., 203 Broadway, N. Y. City.
- ROME**—spiral tubing, Rome-Turney Radiator Co., Rome, N. Y.
- ROME QUALITY**—brass & copper tubing, rivets, sheets wire & rods, Rome Brass & Copper Co., Rome, N. Y.
- RONI**—acetylene lamp burners, Wm. M. Crane Co., 1131-33 Broadway, N. Y. City.
- RONSON**—auto initials, wrenches, mirrors, li-mousine vases, cigar holders, domelight casings, Ronson Specialty Co., 7 Mulberry St., Newark, N. J.
- ROOT**—rim bending machines, rim packer, variety saw, band saw, self feed rip saws, portable saws, saw materials, etc., B. M. Root Co., York, Pa.
- ROPER SAFETY**—solid & reversing propellers, C. F. Roper, Hopedale, Mass.
- \*ROPELESS**—boat steering apparatus, Joshua A. Ludlow, 1 Madison Ave., N. Y. City.
- ROSE**—washer & gasket cutters, J. A. Rose, Hastings, Neb.
- ROSS**—steering devices and compensating gears, Ross Gear & Tool Co., Main & 9th Sts., Lafayette, Ind.
- ROTH**—dynamos, electric motors, grinders, blowers, polishing & buffing machines & switchboards, Roth Bros. & Co., 1374 W. Adams St., Chicago, Ill.
- ROUGES**—polishing compounds, Matchless Metal Polish Co., N. Y. City.
- ROUGH RIDER**—cushion springs, Jackson Cushion Spring Co., Jackson, Mich.
- ROUGH RIDER**—extension motorcycle grips, Hartford Rubber Works Co., 691 Park St., Hartford, Conn.
- ROUGH RIDER**—fuel & oil cans, Manufacturers' Can Co., 434 Mulberry St., Newark, N. J.
- ROUGH STUFF**—colors, Ditzler Color Co., 18-24 Baltimore Ave., W., Detroit, Mich.
- ROULETTE**—auto dome lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- \*ROUNTREE-STIMMEL**—automobile clocks, Auto Check Mfg. Co., 1717 Broadway, N. Y. City.
- ROWE**—gasoline auto engines, Rowe Motor Co., Waynesboro, Pa.
- W. & H. ROWLAND**—auto leaf springs, William & Harvey Rowland, Frankford, Phila., Pa.
- ROYAL**—automobile jacks, Motor Car Equipment Co., 55 Warren St., N. Y. City.
- ROYAL**—belting, Thermoid Rubber Co., Trenton, N. J.
- \*ROYAL**—enamels, Royal Enameling & Stamping Works, Desplaines, Ill.
- ROYAL**—forges, pressure blowers & tuyere irons, Canedy-Otto Mfg. Co., Chicago Heights, Ill.
- ROYAL**—jacks, John C. Blevney, 216-224 High St., Newark, N. J.
- ROYAL**—leather dressing, Royal Leather Color Co., 62 Pearl St., Buffalo, N. Y.
- ROYAL**—marine gasoline engines, Royal Engine Co., Bridgeport, Conn.
- ROYAL**—metal & wood polish, Royal Lubricating Co., 116 Broad St., N. Y. City.
- ROYAL**—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.
- ROYAL**—wood polish, Royal Lubricating Oil Co., 116 Broad St., N. Y. City.
- ROYAL ARCH**—cushion springs, Detroit Wire Spring Co., 21st & Standish Sts., Detroit, Mich.
- ROYAL DE LUXE**—acetylene & oil auto lamps, The Post & Lester Co., 20 Sargeant St., Hartford, Conn.
- ROYAL WORCESTER**—belt dressing & belt facing, Graton & Knight Mfg. Co., 94-104 Bloomingdale Rd., Worcester, Mass.
- \*RUBBA-SILK**—fabrics, rubber coated silks & satins, Wm. M. Poz, 134-136 Spring St., N. Y. City.
- RUBBER CO. OF AMERICA**—auto tires, Rubber Co. of America, 149 Broadway, N. Y. City.
- RUBBERLIFE**—tire preservative, Rubberlife Mfg. Co., Grand Rapids, Mich.
- RUBBERSET**—lacquer brushes, Hanson & Van Winkle Co., Newark, N. J.
- RUBBERWHITE**—rubber preservatives, Auto & Aeronautic Supply Co., 2100 Broadway, N. Y. City.
- RUBY**—wiping rags, Continental Waste Co., 22 Clayton St., Boston, Mass.
- RUBY**—oils, Hinds & Coon, 124-26 Pearl St., Boston, Mass.

RUBY—oil stones, Chicago Wheel & Mfg. Co., 1101-03 W. Monroe St., Chicago, Ill.  
 RUBY FLUID—soldering flux, Ruby Chemical Co., Johnstown, Ohio.  
 RUBY-RUB—metal polish, Hinds & Coon, 124-26 Pearl St., Boston, Mass.  
 RUDIE—muffler cut-out valves, Findeisen & Kropf Mfg. Co., 2100 S. Rockwell St., Chicago, Ill.  
 RUFF—anti-skid chains & chain grips, Ruff Spring Tire Chain Co., 71 Cortlandt St., N. Y. City.  
 RUNEASY—oils & greases, W. R. Winn, 143 Maiden Lane, N. Y. City.  
 RUNG—tire inflators (mechanical), Rung Automatic Tire Pump Co., 200 Franklin Bank Bldg., Phila., Pa.  
 RUSHMORE—lights and generators, Rushmore Dynamo Works, 623 South Ave., Plainfield, N. J.  
 RUSKIN—side lights, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.  
 RUSSELL-JENNINGS—auger bits, Russell-Jennings Mfg. Co., Chester, Conn.  
 RUTENBER—auto and marine motors, Western Motor Co., Logansport, Ind.  
 RUTHERFORD—pneumatic wheels, Rutherford Wheel Co., Stamford, Conn.  
 RUUD—gas water heaters for garage use, Ruud Mfg. Co., Pittsburg, Pa.

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S—chisels & tire bolts, H. D. Smith & Co., Plantsville, Conn.  
 S & B—pressure gauges & hydrometers & engine revolution counters, Schaeffer & Budenberg Mfg. Co., 963-5 Kent Ave., Brooklyn, N. Y.  
 S. B. R.—muffler cut-outs, The S. B. R. Specialty Co., 1771 Broadway, N. Y. City.  
 \*S. & C.—primary magneto plugs, Sprague & Carr, Howell, Mich.  
 S. H. CO.—adjustable reamers, American Specialty Co., 834-35 Monadnock Bldg., Chicago, Ill.  
 S-M POSITIVE—spark plugs, Seidler-Miner Supply Co., 207-211 Jefferson Ave., Detroit, Mich.  
 SMSCO—acetylene gas generators, Sterling Machine & Stamping Co., Wellington, O.  
 S. P. O.—machinery, ball bearings, tools, etc., imported by S. P. O. Automobile Co., 1595 Broadway, N. Y. City.  
 SRB—roller & ball bearings & thrust bearings, Standard Roller Bearing Co., 50th & Lancaster Ave., Phila., Pa.  
 S. R. O.—ball bearings, imported by Theo. H. Marburg, Room 12, 59 Wall St., N. Y. City.  
 S & W—starting cranks, Stryker & Woessner, Huron, O.  
 S. & W.—steering devices & ball sockets, Schweppe & Wilt Mfg. Co., Meldrum & Champlain Sts., Detroit, Mich.  
 S X—ignition batteries, dry, & magnetos, Lutz-Lockwood Mfg. Co., Aldene, N. J.  
 SABISKA—top dressing, The Oriental Leather Finish & Chemical Co., 493 Union St., Lynn, Mass.  
 \*SABLE—rawhide belts, Shultz Belting Co., St. Louis, Mo.  
 SACO—cotton pins, F. P. Smith & Co., Sharon Hill, Pa.  
 SAFE—stationary engines, steam, Ontario Iron Works, Pulaski, N. Y.  
 SAFEGUARD—grease, Wm. T. Baker, 228-32 Suydam Ave., Jersey City, N. J.  
 SAFETY—combination pump connection & air gauge & shock absorbers, Safety Tire Gauge Co., 1463 Michigan Ave., Chicago, Ill.  
 \*SAFETY—pumps for boat whistles or tires, Safety Air Pump Co., 182 Sheridan Ave., Detroit, Mich.  
 SAFETY—rubber hose & belting, United & Globe Rubber Mfg. Co., Trenton, N. J.  
 SAFETY—stationary boilers, Ontario Iron Works, Pulaski, N. Y.  
 SAFETY—waste cans, Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.  
 SAFETY OFFSET—clocks, Manasseh Levy & Co., 182 Broadway, N. Y. City.

\*SAGAMORE—gasoline marine motors, Sagamore Engine Co., 71-73 Sagamore St., Lynn, Mass.  
 SAGER—removable rims & equalizing springs, J. H. Sager Co., 265 South Ave., Rochester, N. Y.  
 SAGER—toe clips, The Standard Co., Torrington, Conn.  
 ST. JOHN—solid automobile tires & bicycle tires, St. John Rubber Co., 116 Broad St., N. Y. City.  
 ST. LOUIS—tool grinders, sensitive drills, tapping machines & chucks, St. Louis Machine Tool Co., 1405 S. 7th St., St. Louis, Mo.  
 ST. MARY'S—stationary engines & charging apparatus, St. Marys Machine Co., St. Marys, Ohio.  
 SALAMKA—top dressing, The Oriental Leather Finish & Chemical Co., 493 Union St., Lynn, Mass.  
 SALISBURY—leggings & gauntlets, American Tire Co., Owosso, Mich.  
 SALT WATER—dry batteries, Loane-Hiltz Engineering Co., 320 S. Hanover St., Baltimore, Md.  
 SALT WATER—dry batteries, Salt Water Battery Co., 306 S. Hanover St., Baltimore, Md.  
 SAMPSON—brass tire plugs, Stevens & Co., 375 Broadway, N. Y. City.  
 SAMPSON—hand punches, Gem Tool Works, 2 Hudson St., N. Y. City.  
 SAMSON—belting, Thermoid Rubber Co., Trenton, N. J.  
 SAMSON—misc. valves, The Lunkenheimer Co., Cincinnati, O.  
 SAMSON—rubber automobile tires & inner tubes, imported by Rex Tire Co., 138 W. 68th St., N. Y. City.  
 SAMSON CAPE NOIRE—non-skidding leather tires, imported by Rex Tire Co., 138 W. 68th St., N. Y. City.  
 SAMSON TYPE COURSE—non-skidding tires, imported by Rex Tire Co., 138 W. 68th St., N. Y. City.  
 SANFORD—portable welding machines, F. C. Sanford Mfg. Co., Bridgeport, Conn.  
 SANGAMO—meters, Sangamo Electric Co., Springfield, Ill.  
 \*SANKEY—radiator fans, imported by Edward E. Cary Co., 59-61 Park Pl., N. Y. City.  
 SATIN FINISH—metal washers, Mason Machine Co., Bridgeport, Conn.  
 SAUNDERS—pipe cutters, Ayes & Co., 1812-16 Ellen St., Chicago, Ill.  
 SAVE-TIRE, THE—vulcanizers, Savetire Company, 83 First Ave., Grand Rapids, Mich.  
 \*SAWYER—brake bands, belting & belt dressing, Sawyer Belting Co., Cleveland, Ohio.  
 SAWYER—machinists' small tools, measuring gauges, machinists' clamps, hack saw frames, Sawyer Tool Mfg. Co., Fitchburg, Mass.  
 SAXON—acetylene, electric & oil auto lamps (also motorcycle), Saxon Lamp Co., Inc., 530 W. 28th St., N. Y. City.  
 SAXON—wrenches, Kilborn & Bishop Co., 81 Lloyd St., New Haven, Conn.  
 SAXON & SAXON, JR.—electric auto horns, The Russell Electric Co., Danbury, Conn.  
 SCHAAP—welding, Schaap Flame Utilities Corporation, 344 Cumberland St., Brooklyn, N. Y.  
 SCHAEFER—gasoline marine motors, Schaefer Mfg. Co., Berlin, Wis.  
 SCHAFER—annular ball bearings, imported by Barthel, Daly & Miller, 42 Broadway, N. Y. City.  
 SCHATZ—hand & power punches & hand & power shears, The Schatz Mfg. Co., Poughkeepsie, N. Y.  
 SCHAU—tire setting machines, Burt Mfg. Co., Clinton & Fulford Sts., Kalamazoo, Mich.  
 SCHERBLER—carburetors and fuel strainers, Wheeler & Scherbler, Shelby, Barth & Sanders St., Indianapolis, Ind.

- SCHELLENBACH—lathes, The John B. Morris Foundry Co., Cincinnati, Ohio.
- SCHENECTADY—spark plugs, Schenectady Spark Plug Co., 1259 State St., Schenectady, N. Y.
- SCHIEREN'S—clutch valve, lace & hydraulic leather, Chas. A. Schieren Co., Schieren Bldg., N. Y. City.
- SCHILDBACK—wind shields, Limousine Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill.
- SCHLENKER—tapping machines, Howard Iron Works, Buffalo, N. Y.
- \*SCHNEIDER—resilient automobile wheels, Schneider Mfg. Co., 30 Church St., N. Y. City.
- SCHRADER UNIVERSAL—bicycle, motorcycle and auto valves, A. Schrader's Sons, 28-32 Rose St., N. Y. City.
- SCHUBERT—aluminum & wood auto bodies, auto tops, seats & trimmings, Schubert Bros. Gear Co., 44 Cedar St., Oneida, N. Y.
- SCHUG—spark coils, Schug Electric Mfg. Co., 320 Jefferson Ave., Detroit, Mich.
- SCHULZ—spinning lathes, power hammers, horn power presses, spinning tools & rivet spinners, Fritz A. Schulz, 66 N. Jefferson St., Chicago, Ill.
- SCHWARTZ—metal melting furnaces, The Hawley Down Draft Furnace Co., First National Bank Bldg., Chicago, Ill.
- SCHWARZ—wooden automobile wheels, The Schwarz Wheel Co., 20th & Glenwood Ave., Phila., Pa.
- \*SCHWEIZER—gasoline marine motors, Schweizer Motor Co., 605-07 Eastern Ave., Ex. Baltimore, Md.
- SCIENTIFIC—cutting compounds, White Refining Co., 77 Main St., Buffalo, N. Y.
- SCLEROSCOPE—testers, for testing hardness of metals, Shore Instrument & Mfg. Co., 226 W. 24th St., N. Y. City.
- \*SCOTT—gasoline marine motors, Henry L. Scott & Co., 227 Eddy St., Providence, R. I.
- SCOTT—muffler cut-outs, The Capitol Hill Garage Co., 821 Corona St., Denver, Colo.
- SCOTT'S—neck, ear, face and chest mufflers, Scott Knitting Co., 175 Main St., Portsmouth, O.
- SCRANTON—axles, The Scranton Axle Works, Scranton, Pa.
- SCRANTON—power hammers, Scranton & Co., New Haven, Conn.
- SEABERG—elevators, Gust. Seaberg, 407 Douglass St., Brooklyn, N. Y.
- SEAMANS—chain steerers, W. H. Lindley Co., Main & Canal Sts., Canastota, N. Y.
- SEAMON & MYERS—taximeters, A. J. Myers, 244 W. 49th St., N. Y. City.
- SEARCHLIGHT—acetylene gas tanks, The Searchlight Gas Co., Pittsburg, Pa.
- SEARCHLIGHT—gas bicycle lamps, Bridgeport Brass Co., cor. Fairfield & Holland Aves., N. Y. City.
- SEARCHLIGHT—metal polish, Boston Grease Co., Boston, Mass.
- SEARIGHT'S—lever shears, Detroit Shear Co., 139 Beaubien St., Detroit, Mich.
- SECOND MAN—auto tire tools, B. Morgan, Tew's Court, Old Beach Road, Newport, R. I.
- SECTIONAL—auto tire protectors, American Tire Co., Owosso, Mich.
- SECURITY—automatic time switch, F. Bissell Co., Toledo, O.
- SECURITY—demountable rims, Security Demountable Rim Co., 215-217 E. 21st St., Chicago, Ill.
- \*SECURITY—ignition batteries, switches & ignition apparatus for motor boats, Josiah A. Ludlow, Madison Ave., N. Y. City.
- SECURITY—license tags, The Cassady-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- SECURITY—locking handles, etc., C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- SECURITY—robe and apparel holder, The Imperial Brass Mfg. Co., 441 S. Jefferson St., St., Chicago, Ill.
- SECURITY—tire liners & patches, Security Reliner Co., Montgomery, N. Y.
- SECURITY TREAD—auto pneumatic tires, Batavia Rubber Co., Batavia, N. Y.
- SEELEY—timers, terminals, ignition cable & magnetos, High Frequency Ignition Coil Co., 126 E. 9th St., Los Angeles, Cal.
- SEGERSTROM—vulcanizers, Segerstrom Vulcanizer Co., 219 S. 7th St., Minneapolis, Minn.
- SEIDEL—crucibles, R. B. Seidel, Inc., 1322 Callowhill St., Phila., Pa.
- SELBACH—inner tire sleeves, tire cement & tire patches, Selbach Rubber Co., 471 Tremont St., Boston, Mass.
- "SELF-PROPELLED VEHICLES"—by Homan (book), Theo. Audel & Co., 63 Fifth Ave., N. Y. City.
- SELF-SEALING—spark coil condensers, American Electric Co., State & 64th Sts., Chicago, Ill.
- SELF SNAP—spark controlling & cut-out levers, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- SEMENT-OL—boiler & radiator compounds, Northwestern Chemical Co., Marietta, O.
- SEMI-DRY—dry ignition batteries, The Semi-Dry Battery Co., Fifth & Essex Sts., Harrison, N. J.
- SEMPER-ITEM—bearing metal & solder, Thomas Wildes' Sons, 21 Maiden Lane, N. Y. City.
- SENECA FALLS—lathes, Seneca Falls Mfg. Co., 516 Water St., Seneca Falls, N. Y.
- SENSIBLE—screw drivers, Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn.
- SENTINEL—electric auto lamps, R. E. Dietz Co., 60 Lighthouse St., N. Y. City.
- SENTINEL—oil cups, auto, The Lunkenheimer Co., Cincinnati, O.
- SERVICE—wrenches, Harris & Reed Mfg. Co., 1500-1578 W. 15th St., Chicago, Ill.
- 7X—auto heaters, Chicago Flexible Shaft Co., Chicago, Ill.
- SEXTON—fuel & oil cans, measures, gasoline storage tanks & pumps, Tire pumps & gasoline storage outfits, Sexton Can Co., 2 Hartford St., Boston, Mass.
- SHAIN'S BALL SPRAY—carburetors, Chas. D. Shain, 70 Murray St., N. Y. City.
- SHAIN'S—ignition cables, spark plugs & wire terminals, Chas. D. Shain, 70 Murray St., N. Y. City.
- SHALER—vulcanizers, C. A. Shaler Co., Wau-pun, Wis.
- SHAMROCK EXCELSIOR—motorcycle tires, N. S. U. Motor Co., 206 W. 76th St., N. Y. City.
- SHAMROCK GLORIA—rubber motorcycle belts, N. S. U. Motor Co., 206 W. 76th St., N. Y. City.
- SHARP—spark plugs, J. & W. Sharp & Co., Cleveland, O.
- SHAW—complete power outfit for bicycles, Shaw Mfg. Co., Galesburg, Kan.
- SHAWMUT—portable electric lights, Chase-Shawmut Co., Newburyport, Mass.
- SHAWMUT—automobile tires, tire accessories & blowout patches, The Shawmut Tire Co., Boston, Mass.
- SHAWMUT—spark plugs, Blake Electrical Co., 88 Purchase St., Boston, Mass.
- SHAWMUT—tires, Hood Rubber Co., 99 Bedford St., Boston, Mass.
- SHELBY—seamless steel tubing, axle tubes, boiler tubes, auto bells, compressed air tanks & gongs, National Tube Co., Frick Bldg., Pittsburg.
- SHELDON—axles & springs, Sheldon Axle Co., Wilkes-Barre, Pa.
- SHELDON—hammers & boring machines, W. W. Crane Foundry & Machine Works, Auburn, N. Y.
- SHELTON—metallic filler, Shelton Metallic Filler Co., Derby, Conn.
- SHEPARD—cranes, electric & pneumatic hoists, pneumatic compression riveters, trolleys & tramways, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.
- SHEPARD—vises, Prentiss Vise Co., 44 Barclay St., N. Y. City.

- SHEPARDSON**—screw drivers, H. H. Mayhew Co., Shelburne Falls, Mass.
- SHERK'S ENTERPRISE CAR RENOVATOR**—wood polish, The Enterprise Supply Co., 501 Commercial National Bank Bldg., Chicago, Ill.
- SHERMAN**—hose couplings, H. B. Sherman Mfg. Co., 12 Barney St., Battle Creek, Mich.
- SHERMAN**—spark plugs, G. H. Sherman & Son, 419 St. Aubin Ave., Detroit, Mich.
- SHERMAN & SMITH**—gasoline stationary engines, Sherman & Smith Mfg. Co., Independence, Iowa.
- \*SHERWELL**—steering wheels, motor boat, C. H. Sherwell, Ogdensburg, N. Y.
- SHERWOOD**—lubricators, grease cups, oil pumps, carburetors, Sherwood Mfg. Co., 1702-12 Elmwood Ave., Buffalo, N. Y.
- SHIMER**—cutters, cutter-heads & moulding machines, Samuel J. Shimer & Sons, Milton, Pa.
- SHINEAUL**—metal polish, The Ericka Mfg. Co., Inc., 872-888 Liberty St., Springfield, Mass.
- SHINEBRIGHT**—metal polishes, Buffalo Specialty Co., 375-77 Ellicott St., Buffalo, N. Y.
- SHINEBRIGHT**—metal polish, United Supply Agency, 912 Westminster St., Providence, R. I.
- SHIPLEY**—automatic self-adjusting lamp brackets, Automatic Headlight Co., 299 Broadway, N. Y. City.
- SHIPMAN**—carburetors, Ralph Shipman, Sunbury, Pa.
- \*SHOCKSORBER**—shock absorber, Acme Spring Check Co., 1717 Broadway, N. Y. City.
- SHOEMAKER**—motorcycle & fan pump & oiler belts, Apex Belting Co., 242 Chestnut St., Phila., Pa.
- SHOFO**—hand cleansing compound, John T. Stanley, 650 W. 30th St., N. Y. City.
- SHO-FUR**—auto robes, Burlington Blanket Co., Burlington, Wis.
- SHONBERG**—motor bronze, I. Shonberg, 363 Hudson Ave., Brooklyn, N. Y.
- SHORT**—gasoline auto & marine engines & stationary engines, W. M. Ryan Co., 314 S. Canal St., Chicago, Ill.
- \*SHULTZ**—belt dressing & rawhide leather, Shultz Belting Co., St. Louis, Mo.
- SHUMARD'S**—front spring outfit for runabouts, The Special Motor Vehicle Co., 8th & Broadway, Cincinnati, O.
- SHUR HOLD**—tire sleeves & tire repair articles, Inner Shoe Tire Co., 64 Monroe St., Grand Rapids, Mich.
- SIBLEY & WARE**—drill presses, Sibley Machine Tool Co., South Bend, Ind.
- SIDNEY**—band saws, saw tables, jointers, swing saws, planers & shapers, The Sidney Tool Co., Sidney, Ohio.
- SIGNAL**—bicycles, Gendron Wheel Co., Toledo, O.
- SIGNAL**—horns, imported by Autolyte Mfg. Co., 26 Warren St., N. Y. City.
- SILEX**—Gear case compound, Borne, Scrymser & Co., 80 South St., N. Y. City.
- SILICIA**—storage batteries, Silicia Storage Battery Co., 29 W. 23rd St., N. Y. City.
- SILVER DUST**—metal polish, Acme Polish Co., 810 Second Ave., Pittsburg, Pa.
- SILVER**—forges, band saws, drilling machines, wood planers & swing saws, Silver Mfg. Co., Salem, Ohio.
- SILVER KING**—wrenches, C. M. B. Wrench Co., Industrial Bldg., Syracuse, N. Y.
- SILVER STEEL**—hack saw frames, E. C. Atkins & Co., Indianapolis, Ind.
- SILVEY**—ignition batteries, W. L. Silvey, Dayton, O.
- SIMMS**—magnetos, imported by Simms Magneto Co., 42 Broadway, N. Y. City.
- SIMONDS**—files, hack saws, hack saw frames, screw slotters & file handles, Simonds File Co., Fitchburg, Mass.
- SIMPLEX**—battery connections & primary & secondary terminals, Geo. W. Bolton, 260 Wreford Ave., Detroit, Mich.
- SIMPLEX**—cranes & hoists, D. Round & Son, Cleveland, Ohio.
- SIMPLEX**—hack saws, The Simplex Mfg. Co., 90 West St., N. Y. City.
- SIMPLEX**—ignition storage batteries, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.
- SIMPLEX**—insulated wire, Simplex Electrical Co., 110 State St., Boston, Mass.
- SIMPLEX**—license tags, The Cassidy-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.
- SIMPLEX**—motorcycle speed devices, pulleys, belt hooks, handle-bar switches, cable clips, etc., Prospect Motor Co., 1900 Broadway, N. Y. City.
- SIMPLEX**—pliers, Crescent Tool Co., Jamestown, N. Y.
- SIMPLEX**—robe rails, The James Murdock, Jr., Co., 112 Opera Place, Cincinnati, O.
- SIMPLEX**—spark plugs & mica cores, Auto Specialties Mfg. Co., 656-658 3rd St., Milwaukee, Wis.
- SIMPLEX**—steering gears, B. Roth Tool Works, 2122-28 Choteau Ave., St. Louis, Mo.
- SIMPLEX**—universal joints, Acme Universal Joint & Mfg. Co., 310-14 E. Water St., Kalamazoo, Mich.
- SIMPLICITY**—auto tops & wind shields, Consumers Auto Supply Co., 412 Diamond St., Pittsburg, Pa.
- SIMPLICITY**—rectifier, Auto & Supply Mfg. Co., 2366 Woodhill Road, Cleveland, Ohio.
- \*SIMPLICITY**—reversing gears for motor boats, Simplicity Gear Co., Detroit, Mich.
- SIMPLICITY**—water cut-off, The Vehicle Specialty Co., Inc., 26 State St., Hartford, Conn.
- SINGER**—sewing machines for stitching leather, Singer Sewing Machine Co., N. Y. City.
- SINGLESPARK**—timers, The Kneaga Co., Inc., Washington, D. C.
- SINGLE SPARK VIBRATOR**—spark coils, C. Per Lee Noxon, 500 E. Water St., Syracuse, N. Y.
- SINTZ**—timers & boat propellers, Wilmarth & Morman Co., 583 Canal Ct., Grand Rapids, Mich.
- SINTZ**—gasoline auto & marine engines, stationary engines & speed change gears, motors & auto truck engines, Guy L. Sintz Co., Marshall, Mich.
- SIRENO**—electric auto & motorcycle horns & switches, The Sireno Co., 39-41 Cortlandt St., N. Y. City.
- SIRO**—carburetors, Siro Carburetor Mfg. Co., 31 Taylor St., Springfield, Mass.
- SIROCCO**—fans, American Blower Co., Detroit, Mich.
- SIX IN ONE**—motorists' tools, A. Nelson Mfg. Co., 564 W. Randolph St., Chicago, Ill.
- SKAT**—hand cleansing compounds, Skat Mfg. Co., Hartford, Conn.
- SKELLY**—nuts & bolts, Thos. P. Skelly & Co., 24th St. below Callowhill, Phila., Pa.
- SKENE**—marine chocks, A. S. Morss Co., 210-212 Commercial St., Boston, Mass.
- SKIDOO**—hand soap, The Skidoo Soap Co., cor. Michigan & Buttles Ave., Columbus, Ohio.
- SKINNER**—chucks, face plate jaws, lathe face plates, Skinner Chuck Co., New Britain, Conn.
- SKINNER**—pumps & recoil checks, Skinner & Skinner, 1337 Michigan Ave., Chicago, Ill.
- \*SKIPABOUT**—gasoline motor boats, C. A. Johnson, Short Beach, Conn.
- SKIPPER**—gasoline marine motors, Gray-Hawley Mfg. Co., 605-609 Fort St., W. Detroit, Mich.
- SLAMA**—tire protectors, Slama Tire Protector Co., 1501 Grand St., Kansas City, Mo.
- SLIP-NOT**—belt & clutch dressing, Cleveland Auto-Clutch Dressing Co., Cleveland, Ohio.
- SLIP-OVER**—emergency tires, Slip-Over Tire Co., 204 S. Boots St., Marion, Ind.
- SLOANE**—gasoline auto & marine motors, Sloane Motor Co., 108-16 W. Indiana St., Chicago, Ill.
- SLOCOMB**—drills, micrometer calipers & micrometer height & depth gauges, J. T. Slocomb Co., 29 Oxford St., Providence, R. I.

- SMALLEY—gasoline marine motors, General Machinery Co., Bay City, Mich.
- SMITH—automobile parts, A. O. Smith Co., Park, Clinton & Virginia Sts., Milwaukee, Wis.
- \*SMITH—countershafts, Smith Countershaft Co., 141 Milk St., Boston, Mass.
- SMITHICKS—belt fasteners, F. P. Smith & Co., Sharon Hill, Pa.
- contact maker, Atwater Kent Mfg. Works, J. BARTON SMITH—files & rasps, Nicholson File Co., Providence, R. I.
- SMITH'S—spar coating & varnish, Edward Smith & Co., 129 West Ave., Long Island City, N. Y.
- SMOOTH-ON—metal cements, Smooth-on Mfg. Co., 572-574 Communipaw Ave., Jersey City, N. J.
- SNAP-ON—spark plug terminals, Geo. W. Bolton, 260 Wreford Ave., Detroit, Mich.
- SNECKNER—gasoline marine motors, Stamford Motor Co., Inc., Foundry, Water & Atlantic Sts., Stamford, Conn.
- SNELL—bicycles, Consolidated Mfg. Co., Toledo, O.
- SNELL—auger bits, chisels & punches, Snell Mfg. Co., Fiskdale, Mass.
- SNELL—gasoline & oil storage outfits, Hydraulic Oil & Distributing Co., 606 Penobscot Bldg., Detroit, Mich.
- SNOW FLAKE—soldering salt, Grasselli Chemical Co., Cleveland, Ohio.
- SOLAR—lamps, lamp brackets & acetylene gas generators, Badger Brass Mfg. Co., Kenosha, Wis.
- SOLARINE—metal polish, Harry A. Allers & Co., 136 Liberty St., N. Y. City.
- SOLDERINE—soldering sticks, Solderine Co., 37 Hartford St., Boston, Mass.
- SOLVOLITE—carbon removers, anti-freezing solutions & soapstone, T. J. Peterson Co., Security Bldg., Chicago, Ill.
- SOMBREKOL—top dressing, The Oriental Leather Finish & Chemical Co., 493 Union St., Lynn, Mass.
- SOOTLESS—spark plugs, The Oakes & Dow Co., 15 Chardon St., Boston, Mass.
- SOOT-PROOF—spark plugs, C. A. Mezger, Inc., 239 W. 56th St., N. Y. City.
- SOP-O-ZON—hand cleansing Compound, Bobrick Chemical Co., 111-117 S. Garey St., Los Angeles, Cal.
- SORENSEN—chain guard & silencer, Sorensen Chain Guard & Silencer Co., 1712 Michigan Ave., Chicago, Ill.
- SPARE'S—manganese, white, hydraulic & plastic bronze, American Manganese Bronze Co., 99 John St., N. Y. City.
- SPARGER'S—welding compounds, Mont. H. Dingee, Lynchburg, Va.
- SPARK GENERATOR—coil, distributor & contact maker, Atwater Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa.
- SPARROW—metal polish, grease & oil, American Oil & Disinfectant Co., 96 Beekman St., N. Y. City.
- SPARTAN—wrenches, Drop Forging Co., of N. Y., West Side Ave. & Fisk St., Jersey City, N. J.
- SPAULDING—gasoline marine engines, The Spaulding Engine Co., St. Joseph, Mich.
- SPEAR'S ADIRONDACK—furs, fur & fur lined coats, auto robes, leggings, mufflers, gloves and caps, Spear-Martin Fur Co., 41 Church St., Burlington, Vt.
- SPECIAL—oils (jobbers), Fidelity Oil Co., 600-602 W. 6th St., Kansas City, Mo.
- SPECIAL BLACK—engine packings, Thermoid Rubber Co., Trenton, N. J.
- SPE-DE-SHYNE—metal polishes, The Cleanola Company, 1101 Fulton Bldg., Pittsburg, Pa.
- SPEED—carburetors, De Tamble Motors Co., Anderson, Ind.
- SPEEDWAY—oils, H. T. Alexander & Co., 17 State St., N. Y. City.
- SPEEDWELL, THE—gasoline auto & marine motors, A. H. Yocom Co., Inc., Oakbrook, Reading, Pa.
- SPENCER—tire inflators, tank level indicators & lubricant injectors, Auto Pump Co., Springville, N. Y.
- SPERMO—grease, Warren Lubricant Co., Buffalo, N. Y.
- SPHERICAL—automobile lamps, Western Mechanical Works, 921 S. Main St., Los Angeles, Cal.
- SPICER—universal joints, Spicer Universal Joint Mfg. Co., Madison Ave. & W. 3rd St., Plainfield, N. J.
- SPIT-FIRE—plugs, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- SPITZLI—jacks, Spitzli Mfg. Co., 6-14 Devereaux St., Utica, N. Y.
- SPLITDORF—coils, switches, timers, magnetos, C. F. Splitdorf, 261-265 Walton Ave., N. Y. City.
- SPORTSMAN—bicycles & tires, New York Sporting Goods Co., 17 Warren St., N. Y. City. (Jobbers.)
- SPOTZOFF—metal polish, Atlantic Refining Co., Citizens Bldg., Cleveland, Ohio.
- SPRAGUE—automobile tops, wind shields, Sprague Umbrella Co., Norwalk, O.
- SPRAGUE—electric dynamometers, hoists & generators, Sprague Electric Co., 527-531 W. 34th St., N. Y. City.
- SPRAGUE'S SPECIAL—wind shields, Sprague Umbrella Co., Norwalk, O.
- SPRING ACTION—wind shields, Emil Grossman Co., 232 W. 58th St., N. Y. City.
- SPRING-BELT—robes, Chicago Auto Robe Supply Co., 157 Market St., Chicago, Ill.
- SPRINGFIELD—aluminum & steel auto bodies & tops, Springfield Metal Body Co., 364 Birnie Ave., Springfield, Mass.
- SPRINGFIELD—caps, Springfield Hat & Cap Co., 31 Taylor St., Springfield, Mass.
- SPRINGFIELD—cup & depth gauges, gasoline & oil pumps for garage use, & gasoline storage tanks, Gilbert & Barker Mfg. Co., 80-82 Fourth Ave., N. Y. City.
- SPRINGFIELD—gasoline marine engines, The Springfield Motor Co., Springfield, Mass.
- SPRINGFIELD—jacks, Shawver Co., Springfield, Ohio.
- SPRINGFIELD MOTOMETERS—speed indicators & odometers, The R. H. Smith Mfg. Co., Springfield, Mass.
- SPRINGFIELD—oil separators for turret lathe chips, National Separator & Machine Co., Boston, Mass.
- STABILITY—brake linings & drums, Royal Equipment Co., 165 Housatonic Ave., Bridgeport, Conn.
- STACKPOLE—battery connections, Stackpole Battery Co., St. Marys, Pa.
- STAG BRAND—leather for trimming, American Leather Mfg. Co., Newark, N. J.
- STAG—tires (bicycle), N. Y. Sporting Goods Co., 17 Warren St., N. Y. City. (Jobbers.)
- STAMFORD—gasoline marine motors, Stamford Motor Co., Inc., Foundry, Water & Atlantic Sts., Stamford, Conn.
- STANDARD ALLOY—steel, brass & bronze balls, Standard Roller Bearing Co., 50th & Lancaster Ave., Phila., Pa.
- STANDARD—anti-skid chains & auto tires, Standard Traction Tread Co., 399 Boylston St., Boston, Mass.
- STANDARD—automobile, cycle & motorcycle horns, bulbs, reeds & flexible tubing, Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J.
- STANDARD—automobile jacks, Cook's Standard Tool Co., Kalamazoo, Mich.
- STANDARD & STANDARD A—lamp guards, Crescent Co., Valparaiso, Ind.
- STANDARD—bicycle & motorcycle pedals, The Standard Co., Torrington, Conn.
- STANDARD—bicycles, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- STANDARD—gasoline marine motors, Standard Gas Engine Co., Dennison & King Sts., Oakland, Cal.
- \*STANDARD—gasoline marine motors, Standard Motor Construction Co., 172-180 Whitten St., Jersey City, N. J.



- STANDARD—hammers, hand, H. Cheney Hammer Co., Little Falls, N. Y.
- STANDARD—hand bellows, Edward Paro, 3626 62nd St., Chicago, Ill.
- STANDARD—heaters & carbon, Standard Stamping Co., Marysville, O.
- STANDARD—horns, Standard Metal Mfg. Co., Chestnut, Jefferson & Malvern Sts., Newark, N. J.
- STANDARD—license tags, Automobile License Indicator Co., Lewisburg, Tenn.
- STANDARD—motorcycle saddles, H. & F. Mesinger Mfg. Co., 1801-03 First Ave., N. Y. City.
- STANDARD—pipe vises, Emmert Mfg. Co., Waynesboro, Pa.
- STANDARD—roller bearings, Standard Roller Bearing Co., 50th & Lancaster Ave., Phila., Pa.
- STANDARD—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.
- STANDARD—soldering flux, Grasselli Chemical Co., Cleveland, Ohio.
- STANDARD—speed indicators, thermostats for vulcanizers, boilers, etc., Standard Thermometer Co., 65 Shirley St., Boston, Mass.
- STANDARD—stationary gasoline engines, Elbridge Engine Co., Culver Road, Rochester, N. Y.
- STANDARD—steam, air & water pressure gauges, gauge cocks, safety valves, water gauges, lubricators, tire pressure registers, revolution counters & electric clocks, Industrial Instrument Co., Foxboro, Mass.
- STANDARD—tire holders, Cox Brass Mfg. Co., N. Pearl & Van Woert Sts., Albany, N. Y.
- STANDARD—tire protectors, Standard Tire Protector Co., Saginaw, Mich.
- \*STANDARD—top dressing, The Consolidated Chemical Co., 691-693 W. Fort St., Detroit, Mich.
- STANDARD—trunk racks, Connecticut Steel & Wire Co., 57-61 Allyn St., Hartford, Conn.
- \*STANDARD—wrenches, Brock Wrench Mfg. Co., 18 Dey St., N. Y. City.
- \*STANLEY—gasoline marine engines, Boston Gasoline Engine Co., 19 High St., Boston, Mass.
- \*STANLEY—gasoline marine motors, The Stanley Co., 79 Milk St., Boston, Mass.
- STAPLEY—tire pumps, Bridgeport Brass Co., cor. Fairfield & Holland Aves., N. Y. City.
- \*STAR—auto body soap & metal polish, C. C. Richmond & Co., 40 Batterymarch St., Boston, Mass.
- STAR—ball retainers & ball thrust bearings, Star Ball Retainer Co., Lancaster, Pa.
- STAR—bicycle pedals, The Standard Co., Torrington, Conn.
- STAR—bumpers, gas generators, foot rails, lamp brackets, robe rails, nuts & bolts, tire holders, pumps, wire cloth, etc., W. T. Hungerford Brass & Copper Co., 497-503 Pearl St., N. Y. City.
- STAR—double swivel vises, Spitzli Mfg. Co., 6-11 Devereaux St., Utica, N. Y.
- STAR—engine, foot-power, speed wood turning & bench lathes, Seneca Falls Mfg. Co., 416 Water St., Seneca Falls, N. Y.
- STAR—escutcheon pins, Turner & Seymour Mfg. Co., Torrington, Conn.
- STAR—hand shears, Acme Shear Co., Bridgeport, Conn.
- STAR—heaters, auto, Lehman Bros., 10 Bond St., N. Y. City.
- STAR—igniters, Briggs & Stratton Co., Milwaukee, Wis.
- STAR—inner tubes & auto tires, Star Rubber Co., Akron, O.
- STAR—machinists' vises & pipe vises, Fulton Machine & Vise Co., Lowville, N. Y.
- STAR—magnetos, Hercules Electric Co., 2128-2136 Northwestern Ave., Indianapolis, Ind.
- STAR—metal polish, Bell Mfg. Co., 308 N. Commercial St., St. Louis, Mo.
- STAR—odometers & speed indicators, Star Speedometer Co., Danville, Pa.
- STAR—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- STAR—pump connections, Park City Brass Co., Springfield, Mass.
- STAR—rims, auto, Crane & MacMahon, 8-10 Bridge St., N. Y. City.
- STAR—saws, Millers Falls Co., 28 Warren St., N. Y. City.
- STAR—screw drivers, The Elmore Tool Mfg. Co., Hartford, Conn.
- STAR—screw drivers, H. H. Mayhew Co., Shelburne Falls, Mass.
- STAR—self-locking hoists, Hunt-Helm-Ferris & Co., Harvard, Ill.
- STAR—solder, Crescent Co., Valparaiso, Ind.
- STAR—stationary engines, The Star Mfg. Co., New Lexington, O.
- STAR—tapping attachments, Modern Tool Co., Erie, Pa.
- STAR—timers, A. H. Newcomb, 1941 W. 21st St., Chicago, Ill.
- STAR—tire cases, metallic, Merchant & Evans Co., 517 Arch St., Phila., Pa.
- STAR—toe clips, The Standard Co., Torrington, Conn.
- STAR—tubing & brass & copper wire & sheets, Merchant & Evans Co., 517 Arch St., Philadelphia, Pa.
- STAR—vehicle washers, Star Brass Works, 123 N. Jefferson St., Chicago, Ill.
- STAR—webbing, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- STAR A—cutting compounds, White Star Refining Co., 307 White Bldg., Buffalo, N. Y.
- STARALINE—metal polish, Rath, Chas. H. Co., Inc., 1347 N. Front St., Phila., Pa.
- STAR BAR—belt dressing, Graton & Knight Mfg. Co., 94-104 Bloomingdale Road, Worcester, Mass.
- STAR-CLEAN—top dressing & auto body cleansing compound, Alder-Harper Chemical Co., Mount Vernon, N. Y.
- STA-RITE—spark plug protectors & spark plugs, The R. E. Hardy Co., 201 37th St., Brooklyn, N. Y.
- STA-RITE—stationary engines, Reliance Iron & Engine Co., Racine, Wis.
- STAY BRIGHT—brass lacquer, Ajax Auto Co., 832-834 E. 43d St., Chicago, Ill.
- STAY SHINY—tarnish preventives, F. A. Schmoeger, Sterling, Ill.
- STAY-THERE—battery connections, Manhattan Electrical Supply Co., 17 Park Place, N. Y. City.
- STEAMTITE—metal cements, Clark Cast Steel Cement Co., Shelton, Conn.
- STECKER—auto & boat lighting outfits, ignition & charging apparatus, Stecker Electric & Machine Co., Detroit, Mich.
- STEELE-HARVEY—crucible metal melting furnace, Monarch Engineering & Mfg. Co., 1200-1206 American Bldg., Baltimore, Md.
- STEEL KING—spark plugs, National Steel Products Co., Lorain, O.
- STEIN—automobile tires, The Stein Double Cushion Tire Co., Akron, O.
- STEIN—surface grinders, Wm. P. Stein & Co., 282 State St., Rochester, N. Y.
- \*STEINFELD—camping outfits, Steinfeld Bros., 620 Broadway, N. Y. City.
- STEIRO—malleable iron castings, The Columbus Malleable Casting Co., 770 Jefferson Place, Columbus, O.
- STEPNEY—spare motor wheels, United States Wheel & Rim Co., Ltd., St. Anne, Ill.
- STEPTOE—shapers, milling machines, drill & planer vises, The John Steptoe Shaper Co., 2951-61 Colerain Ave., Cincinnati, Ohio.
- STERLING—aluminum bronze, Billings-Chapin Co., Cleveland, Ohio.
- STERLING—automobile tires & inner tubes, Rutherford Rubber Co., Rutherford, N. J.
- STERLING—bicycles, The Pope Mfg. Co., Hartford, Conn.
- STERLING—bicycle wrenches, Frank Mossberg Co., Attleboro, Mass.
- STERLING—expansion clutches, Elkhart Motor Car Co., Elkhart, Ind.
- STERLING—gas & gasoline stationary engines, Charter Gas Engine Co., Sterling, Ill.
- STERLING—hack saw frames and blades, metal sawing machines, power hack saws, emery wheel cutters and emery wheel dressers, Diamond Saw & Stamping Wks., Buffalo, N. Y.



- \*STERLING—metal & wood polishes, Preservative Tire Co., Onawa, Iowa.
- STERLING—oil auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.
- STERLING—spark plugs, C. H. Stoddard, 10 Waldo St., Worcester, Mass.
- STERLING—top dressing & iron enamel, F. A. Schmoeger, Sterling, Ill.
- STERLING JUNIOR—oil auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.
- STEVENS—bilge pumps & crank hangers, Stevens & Co., 375 Broadway, N. Y. City.
- STEVENS—carbon blacking & core ovens, Frederic B. Stevens, Detroit, Mich.
- STEVENS CORE GUM—core compounds, foundry riddles & sieves, cupolas & plumbago, Frederick B. Stevens, Detroit, Mich.
- STEVENSON—carburetors, Hendricks Novelty Co., 124-128 Capitol Ave., S., Indianapolis, Ind.
- \*STEVENS QUALITY—lamp lenses, mirrors & reflectors, Stevens & Co., Providence, R. I.
- STEVENS TRIPOLI COMPOSITION & STEVENS SILVER FINISH—buffing & polishing compounds, Frederic B. Stevens, Detroit, Mich.
- STEWART—auxiliary tire valves, Alfred C. Stewart Machine Works, 1008 Santee St., Los Angeles, Cal.
- STEWART'S DOLAN—gas burners, D. M. Stewart Mfg. Co., Chattanooga, Tenn.
- STEWART—speedometers & odometers, Stewart & Clark Mfg. Co., 1848-60 Diversey Bldg., Chicago, Ill.
- STEWART-PRECISION—carburetors, Alfred C. Stewart Machine Works, 1008 Santee St., Los Angeles, Cal.
- STICKLER WEEDLESS—boat propellers, Stickler Weedless Wheel Co., Portage, Wis.
- STICKNEY—stationary & portable gasoline engines & jacks, Charles A. Stickney Co., St. Paul, Minn.
- STICKNEY—steam automobile boilers, Portland Garage, Portland, Me.
- STICK-TITE—bow separators, Iroquois Auto Top Co., 179-183 Blandina St., Utica, N. Y.
- STILLSON—wrenches, Walworth Mfg. Co., 128 Federal St., Boston, Mass.
- STILSON—gasoline Automobile motors, The Stilson Motor Car Co., Pittsfield, Mass.
- STITCH-IN-TIME—vulcanizers, The J. M. Padgett Co., 118 E. 7th St., Topeka, Kan.
- STITCH-NINE—portable vulcanizers, The J. M. Padgett Co., 118 E. 7th St., Topeka, Kan.
- STOCKBRIDGE—metal shapers, Stockbridge Machine Co., Worcester, Mass.
- STODDARD—switchboards, Roney & Lincoln, 132 Summit Ave., Brookline, Mass.
- \*STOLP—shock absorbers, Oscar Stolp, 20-22 Fletcher St., N. Y.
- STONEHEAGE—asphalt roofing, Asphalt Ready Roofing Co., 136 Water St., N. Y. City.
- STOP LEAK—for repairing leaks in radiators, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.
- \*STORK—gasoline marine motors, Stork Motor Co., Saginaw, W. S., Mich.
- STORMER—bicycles, The Pope Mfg. Co., Hartford, Conn.
- \*STOVER—gasoline marine motors, Stover Motor Car Co., Freeport, Ill.
- \*STOVER—stationary gas & gasoline engines, Stover Engine Works, Freeport, Ill.
- STRAIGHTLINE—ball bearings, The Knege Co., Inc., Washington, D. C.
- STRAIGHTLINE—tank level indicators, PR Mfg. Co., 621-659 Bellevue Ave., Detroit, Mich.
- STRANG—stationary engines & marine kerosene Engines, Strang Engine Co., Harvey, Ill.
- STRATTON—wood & metal bodies & folding tops, C. H. Stratton Carriage Co., Muncie, Ind.
- STRAUB—stationary gasoline, distillate & producer gas engines, Page Engineering Co., 113-121 E. York St., Baltimore, Md.
- \*STREIT—gasoline auto & marine engines, The A. Streit Machine Co., Cincinnati, O.
- \*STRELINGER—gasoline marine engines, Strelinger Marine Engine Co., 46 Congress St., E., Detroit, Mich.
- STROMBERG—carburetors, Stromberg Motor Devices Co., 1253-55 Michigan Ave., Chicago, Ill.
- STRYKER—muffler cut-outs, tire holders & pedals, C. W. Stryker, 314 E. Onondago St., Syracuse, N. Y.
- STUART—gasoline marine motors, John Stuart Co., Wollaston, Mass.
- STUART—molders & automobile shovels, Wood Shovel & Tool Co., Piqua, Ohio.
- STUTZ—axles & speed change gears, Stutz Auto Parts Co., 10th St. & Canal, Indianapolis, Ind.
- SUCCESS—air compressor, E. R. Brown Beer Pump Co., 11 Chardon St., Boston, Mass.
- SUCCESS—curtain fasteners, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.
- SUCCESS—fire extinguishers, H. W. Johns-Manville Co., 100 William St., N. Y. City.
- SUCCESS—spark plugs, tire talc & tire holders, Waite Auto Supply Co., 17 Dorrance St., Providence, R. I.
- SULLIVAN'S—grease & oil, Sullivan Oil Co., 413 Wells St., Chicago, Ill.
- SUMMERSHINE—metal polish, Grady Mfg. Co., 509 W. 30th St., N. Y. City.
- SUMTER—magnets, The Sumter Telephone Mfg. Co., Sumter, S. C.
- SUNBEAM—packings, United & Globe Rubber Mfg. Co., Trenton, N. J.
- SUNLIGHT—acetylene lamp burners & burner tips, American Lava Co., Chattanooga, Tenn.
- SUPER-COIL—bumpers, M. H. Cormack & Co., Motor Mart Bldg., N. Y. City.
- SUPERFINE—varnishes & japans, Heath & Milligan Mfg. Co., 170-72 Randolph St., Chicago, Ill.
- SUPERIOR—auto bearings (babbitt metal), Clum & Atkinson, 575 Lyell Ave., Rochester, N. Y.
- SUPERIOR—brazing compounds, Standard Mfg. Co., 318 S. Canal St., Chicago, Ill.
- \*SUPERIOR—ignition batteries, Geen Electrical Mfg. Co., 180 E. Lake St., Chicago, Ill.
- SUPERIOR—lathes, The Meriden Machine Tool Co., Meriden, Conn.
- SUPERIOR—parting sand, S. H. Brand Co., Chicago, Ill.
- SUPERIOR—soldering furnace, Jacobson Machine Mfg. Co., Warren, Pa.
- SUPERIOR—spark plugs, Superior Motor Specialty Co., 526 Jefferson St., Phila., Pa.
- SUPERIOR—tool bags, crank handle holders & top & hood straps, Frank S. Feeser Co., 1104 Prospect St., Indianapolis, Ind.
- SUPERIOR—transmission oil, Great Western Oil Co., 2855 E. 37th St., Cleveland, O.
- SUPERIOR—upright drills & speed change gears, Superior Machine Tool Co., Kokomo, Ind.
- SUPERIOR QUALITY—soldering flux, Shinal Co., 413 Emmet Road, Toledo, Ohio.
- SUPPLEMENTARY—springs, St. Louis Supplementary Spiral Spring Co., 4524-4526 Delmar Ave., St. Louis, Mo.
- SUPPLEMENTARY SPIRAL SPRINGS—shock absorbers, Supplementary Spiral Bumper Co., 1876 Broadway, N. Y. City.
- SUPREME—oils (jobbers), Fidelity Oil Co., 600-602 W. 6th St., Kansas City, Mo.
- SURETY—grease cups, The Lunkenheimer Co., Cincinnati, O.
- SURE FIRE—ignition batteries, Wachman Auto Mfg. & Supplies, 372 Michigan Ave., Detroit, Mich.
- SURE GRIP—hose clamps, J. R. Clancy, 249 N. Salina St., Syracuse, N. Y.
- \*SURPRISE—exhaust blown horns, Surprise Distributing Co., 1931 Broadway, N. Y. City.
- SURPRISE—wind shields, Sprague Umbrella Co., Norwalk, Ohio.
- SURE SPARK—spark plugs, Fairmount Automobile Co., 126-128 E. King St., Lancaster, Pa.

SWAN—curtain fasteners, Standard Top & Equipment Co., 1206-1212 Huron Rd., S. E., Cleveland, Ohio.

SWASTIKA—tongs, die makers', Buffum Tool Co., Louisiana, Mo.

SWEDOH—steel oil cans & rims, American Tube & Stamping Co. Bridgeport, Conn.

SWEET'S—grease, soap & wood polish, Charles F. Sweet, Inc., 20 Ford St., Hartford, Conn.

SWENSON—motorcycle luggage carriers, cycle stands, cycle lamp brackets, oil pumps & tanks & exhaust key removers, B. A. Swenson, 298 Blackstone St., cor. Prairie Ave., Providence, R. I.

SWINEHART—tires & anti-skid treads, Swinehart Tire & Rubber Co., Akron, O.

\*SWING—unions, Swing Union Co., 115 Water St., New London, Conn.

SWISS KOMET—magnetos, imported by Wende & Co., 350-352 Wabash Ave., Chicago, Ill.

SWIVELACTION—bumpers, Emil Grossman Co., 232 W. 58th St., N. Y. City.

SYMMETRIC—radiators, Metal Stamping Co., 30-50 Hubert St., N. Y. City.

\*SYMPHONY—horns, Standard Engineering & Mfg. Co., 36 Franklin St., Detroit, Mich.

SYRACUSE GARAGE AND SYRACUSE SPECIAL—auto & boat fire extinguishers, The Syracuse Chemical Fire Extinguisher Co., Wood Bldg., Syracuse, N. Y.

SYRACUSE—gasoline marine engines, Syracuse Gas Engine Co., Syracuse, N. Y.

\*SYRACUSE—ignition batteries, Syracuse Storage Battery Co., 118-120 S. State St., Syracuse, N. Y.

SYRACUSE—liquid core compounds, core wash, lead, parting compound, H. E. Mills Mfg. Co., Syracuse, N. Y.

SYRACUSE—transmission gears for autos, Syracuse Gear Co., 105 Grape St., Syracuse, N. Y.

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TC—tool holders, William S. Nicholls, 253 Broadway, N. Y. City.

T. I. C. O.—steel spring wire & roller bearing steel, Trenton Iron Co., Trenton, N. J.

TS—drill press vises, William S. Nicholls, 253 Broadway, N. Y. City.

TT—hack saw blades, Henry G. Thompson & Son Co., New Haven, Conn.

T Y X s—gas hose connections, B. Morgan, T. Y. X s Court, Old Beach Road, Newport, R. I.

TABOR—molding machines, Tabor Mfg. Co., 18th & Hamilton Sts., Phila., Pa.

TABOR—revolution counters, The Grant Mfg. & Machine Co., 90 Silliman Ave., Bridgeport, Conn.

TABOR—wind shields, folding, Parish & Cather, 1006 S. Los Angeles St., Los Angeles, Cal.

TALCUM INSTANT—hand cleansing compound, American Talc Co., 22-24 Custom House St., Boston, Mass.

TANITE—emery wheels, cutters, emery wheel dressers, oil stones, buffing & polishing machines, surface grinders, saw gummers & planers, The Tanite Co., Stroudsburg, Pa.

TANKASCOPE—dash gauge, Boston Auto Gauge Co., 8 Waltham St., Boston, Mass.

\*TANNATE—leather belting, J. E. Rhoads & Sons, 12 N. 3rd St., Phila., Pa.

TARVIA—dust layers, Barrett Mfg. Co., 17 Battery Place, N. Y. City.

TAUNUS—magnetos, imported by The Hess-Bright Mfg. Co., 2102 Fairmount Ave., Phila., Pa.

TAXI—oil auto lamps, R. E. Dietz Co., 60 Laight St., N. Y. City.

TAYLOR—machinists' clamps & wheel pulleys, James L. Taylor Mfg. Co., Bloomfield, N. J.

TAYLOR—tool grinders, Tabor Mfg. Co., 18th & Hamilton Sts., Phila., Pa.

TAYLOR BEST YORKSHIRE—twist drills, imported by B. M. Jones & Co., Inc., 14 Milk St., Boston, Mass.

TAYLOR-NEWBOLD—metal saws, Tabor Mfg. Co., 18th & Hamilton Sts., Phila., Pa.

TEEL—gasoline marine motors, tops & wind shields, Teel Mfg. Co., Medford, Mass.

TELESCOPE—wind shields, Western Brass Mfg. Works, 21st & Campbell Ave., Chicago, Ill.

TEMPLE—stationary gasoline engines, The Temple Pump Co., 17-27 W. 15th St., Chicago, Ill.

TENAX—flange packings, Advance Packing & Supply Co., 55 S. Canal St., Chicago, Ill.

TEN EYCK—tire inflators, Auburn Auto-Pump Co., Mason Lane, Auburn, N. Y.

TERRY—stationary motors, gasoline auto engines, Terry Engine Co., Bay, 43rd & 4th Sts., Ulmer Park, Brooklyn, N. Y.

TESCO—curtain fasteners, The Enterprise Supply Co., 501 Commercial National Bank Bldg., Chicago, Ill.

TEST—storage batteries, Louis M. Pignolet, 78 Cortlandt St., N. Y. City.

TEXODERM—imitation leather, Celluloid Co., 30 Washington Pl., N. Y. City.

THAT STRANG—spark plug, Lewis Strang Supply Co., 2230 Broadway N. Y. City.

THERMIDOR—gaskets & engine packings, Thermoid Rubber Co., Trenton, N. J.

THERMIT—foundry equipment, metals & alloy, Goldschmidt Thermit Co., 90 West St., N. Y. City.

THERMITE—anti-freezing compounds, Northwestern Chemical Co., Marietta, O.

THERMODRY—carbon removers, National Standard Selling Co., 435-B Produce Exchange, N. Y. City.

THERMO—marine engines & batteries, Loane-Hiltz Engineering Co., 320 S. Hanover St., Baltimore, Md.

THERMOID—brake lining, Thermoid Rubber Co., Trenton, N. J.

\*THIEF PROOF—switches, The Thief Proof Auto Lock Co., 208-210 S. Illinois St., Indianapolis, Ind.

THIEM—gasoline cycle motors, motorcycle parts & frames, The Thiem Mfg. Co., Minneapolis, Minn.

THIEM—grease cups, The Winkley Co., 226 Abbott St., Detroit, Mich.

THISTLE—taps & dies, Winter Bros. Co., Wrentham, Mass.

THOMAS—air compressors, W. K. Thomas, 1876 Broadway, N. Y. City.

THOMAS—shock absorbers, Buffalo Specialty Co., 375-377 Ellicott St., Buffalo, N. Y.

THOMAS—top props, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.

THOMPSON—universal grinders, Thompson Grinder Co., Murray & Main Sts., Springfield, O.

THOMPSON—pressed steel clamps, Erie Stamping & Mfg. Co., Erie, Pa.

THOMSON—electric welding machines, Thomson Electric Welding Co., Lynn, Mass.

THOR—air compressors, electric drills, pneumatic drills, pneumatic hoists & riveters, chipping hammers, grinding machines, hose for compressed air, hose couplings, pneumatic seaming machines, wood boring machines, Independent Pneumatic Tool Co., Thor Bldg., Chicago, Ill.

THOR—cycle motors, motorcycle parts, hubs, coaster brakes, automobile motors, motorcycle forks, gasoline marine motors & stationary motors, Aurora Automatic Machinery Co., 1307 Michigan Ave., Chicago, Ill.

THORDARSON—sparking coils, Thordarson-Electric Mfg. Co., 216-20 S. Jefferson St., Chicago, Ill.

3 IN 1—oils, metal polishes, rust preventatives & wood polishes, Three-in-One Oil Co., 42 Broadway, N. Y. City.

TIBRODE BRAND—felt washers, Tinguet, Brown & Co., 64 Reade St., N. Y. City.

TIGER—grease cups, The Lunkenheimer Co., Cincinnati, O.

TIGER—machinists' vises, Emmert Mfg. Co., Waynesboro, Pa.

TI-KI—enamels, paints & varnishes, Acme White Lead & Color Works, Detroit, Mich.

- TILLOTSON—spring frame suspension, John Valentine, 226 La Salle St., Chicago, Ill.
- TIME-SAVER—tire repair kits, Auto Time Saver Repair Kit Co., 178 Devonshire St., Boston, Mass.
- TIMKEN—axles, Timken-Detroit Axle Co., Clark Ave. & Pere Marquette R. R., Detroit, Mich.
- \*TIMOGRAPH—vehicle recorder, Model Mfg. Co., 514 Pearl St., N. Y. City.
- TIP TOP—boat sunshades, Irwin Mfg. Co., Galesburg, Ill.
- TIRE-LAC—rubber preservatives, Northwestern Chemical Co., Marietta, O.
- TIRESELE—tire powder, The Tiresele Co., 53-55 Bank St., Newark, N. J.
- TITAN—indicator throttle valves, Wm. Powell Co., 2521-2531 Spring Grove Ave., Cincinnati, O.
- TITAN—tire cements, Diamond Rubber Co., Akron, O.
- TITUS CLE—wrenches, Motor Parts Co., Plainfield, N. J.
- TOBIN—bronze shafting, Columbian Brass Foundry, Atlantic Ave., Freeport, L. I., N. Y.
- TO GO—motorists' clothing, Auto Garment Co., 208 B Ave., Cedar Rapids, Iowa.
- TOILET TRIPOLI—soap powder, The National Tripolio Co., 543 W. Goodase St., Columbus, Ohio.
- TOKHEIM—gasoline storage outfits, self-measuring, The Tokheim Mfg. Co., Cedar Rapids, Iowa.
- TOLEDO—bicycles, Toledo Metal Wheel Co., Toledo, O.
- TOLEDO—high speed cutting steel, & TOLEDO SHEFFIELD—crucible steel, imported by J. H. Andrew & Co., 107 West St., New York, N. Y.
- TOLEDO—pipe cutters, threading tools & pipe vises, The Toledo Pipe Threading Machine Co., Toledo, Ohio.
- TOLEDO C. W.-W. C.—bows, rims & spokes, The Toledo Carriage Woodwork Co., Toledo, O.
- TON DON—axles, Sheldon Axle Co., Wilkes-Barre, Pa.
- TOOPS—hoods and compound spring & shock absorbers, The Toops Automobile Hood Co., Indianapolis, Ind.
- TOPPAN—gasoline motor boats and engines, Toppan Boat Mfg. Co., 25 Haverhill St., Boston, Mass.
- TOQUET—gasoline marine engines, Toquet Mfg. Co., 1 Madison Ave., N. Y. City.
- \*TOQUET—gasoline marine motors, The Stanley Co., 79 Milk St., Boston, Mass.
- TORBENSEN—gasoline chassis, gasoline automobile motors & transmission gears, Torbensen Motor Car Co., 610 Bloomfield Ave., Bloomfield, N. J.
- TORNADO—tire pumps, Judd & Leland Mfg. Co., Clifton Springs, N. Y.
- TOURIST—oil auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- TOURIST—oil & gasoline kits, Dover Stamping & Mfg. Co., 385 Putnam Ave., Cambridge, Mass.
- TOURIST AUTOKIT—tool kits, Hammacher, Schlemmer & Co., 13th St. & 4th Ave., N. Y. City.
- TOWER'S FISH BRAND—water-proof oiled automobile & yachting clothes, A. J. Tower Co., Vernon & Simmon Sts., Boston, Mass.
- TOWER—wrenches, Tower & Lyon Co., 95 Chambers St., N. Y. City.
- TRAUTMAN'S—tires, pneumatic auto, Ira F. Trautman, 131 6th Ave., Brooklyn, N. Y.
- TRAVER—anti-skid chains, Philip C. Traver Mfg. Co., Far Rockaway, N. Y.
- TRAVER—blowout patch, Traver Blowout Patch Co., 1779 Broadway, N. Y. City.
- H. L. F. TREBERT—gasoline marine & auto engines, H. L. F. Trebert, 407 St. Paul St., Rochester, N. Y.
- TRECO—motor boat whistles & whistle outfits, Russell Electric Co., Danbury, Conn.
- TRENTON TRIANGLE T—tire protectors & inner tubes, Thermoid Rubber Co., Trenton, N. J.
- TRIBUNE—bicycles, The Pope Mfg. Co., Hartford, Conn.
- \*TRIMO—wrenches & pipe cutters, Trimont Mfg. Co., 55-71 Armory St., Roxbury, Mass.
- TRIO—timers (auto & marine), Trio Mfg. Co., 60 Woodbridge St., W., Detroit, Mich.
- TRIPLE ACTION—body springs & shock absorbers, Triple Action Spring Co., 215-217 E. 21st St., Chicago, Ill.
- TRIPLE TREAD—treads, Triple Tread Auto Tire Mfg. Co., 1545 Michigan Ave., Chicago, Ill.
- TRIPLEX—tire pumps, Judd & Leland Mfg. Co., Clifton Springs, N. Y.
- TRIPOLI—toilet soap, The National Tripolio Co., 543 W. Goodase St., Columbus, Ohio.
- TRIPOLINE—metal polish, Matchless Metal Polish Co., N. Y. City.
- TRIUMPH—adjustable license pads, Automobile License Indicator Co., Lewisburg, Tenn.
- TRIUMPH—automobile tires, Thermoid Rubber Co., Trenton, N. J.
- TRIUMPH—auto tire protectors, American Tire Co., Owosso, Mich.
- TRIUMPH—bicycles & bicycle tires, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.
- TRIUMPH—driving chains, Raymond & Co., 331 Michigan Ave., Chicago, Ill.
- \*TRIUMPH—grease, Perfection Grease Co., South Bend, Ind.
- TRIUMPH—motors, carburetors, automobile clutches & levers, Christopher Bros., 3308 Sheffield Ave., Chicago, Ill.
- TRIUMPH—spark plugs, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- TRIUMPH—tank level indicators, tank cutters & tank bushings, Boston Auto Gauge Co., 8 Waltham St., Boston, Mass.
- TRIUMPH—tank level indicators, Janney-Steinmetz & Co., 4th & Market Sts., Phila., Pa.
- TRIUMPH—valve lifters, Mechanical & Electrical Mfg. Co., Rear 2227 Prairie Ave., Chicago, Ill.
- TRIUMPH—weldless chains, Bridgeport Chain Co., Bridgeport, Conn.
- \*TROJAN—automobile motors, transmission gears, steering devices, marine gasoline engines & mufflers, Trojan Motor Co., Louisville, Ky.
- TROJAN—files, American File Sharpener Co., 287 Broadway, N. Y. City.
- TROJAN—files & rasps, Troy File Works, Troy, N. Y.
- TROXEL—bicycle saddles (also motorcycle), Troxel Mfg. Co., Elyria, O.
- TROY—wind shields & speed indicators, Troy Carriage Sunshade Co., Troy, O.
- TRUE—colors, paints & varnishes, Buffalo Enamel & Stain Co., Lord & Clinton & James Sts., Buffalo, N. Y.
- TRUE BLUE—steel belting, The Biddison Mfg. Co., 1516 Williamson St., Madison, Wis.
- TRUFFAULT-HARTFORD—shock absorber, Hartford Suspension Co., 150 Bay St., Jersey City, N. J.
- TRUMP—drill chucks, wrenches, lathe centre grinders, Trump Bros. Machine Co., Wilmington, Del.
- TRUO—oil measures, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.
- TRUSCO—underwater exhausts, Truscott Boat & Auto Supply Co., St. Joseph, Mich.
- TRUSCOTT—canopies, Truscott Boat & Auto Supply Co., St. Joseph, Mich.
- TRUSCOTT—gasoline motor boats, Truscott Boat Mfg. Co., St. Joseph, Mich.
- TUBAL—manganese bronze, Paul S. Reeves & Son, 1415 Catharine St., Phila., Pa.
- TUCKAHOE—self-filling grease & oil guns, Rubly Mfg. Co., Tuckahoe, N. Y.
- TUCK—engine springs, screw drivers, reamers, punches, countersinks & chisels, Tuck Mfg. Co., 74 Ames St., Brockton, Mass.
- TUCKER'S—grease cups, W. L. & C. F. Tucker, 302 Asylum St., Hartford, Conn.
- TUCKER—steering wheel rims, bicycle rims, Tucker Woodwork Co., Sidney, O.
- TUCKERS—window anti-rattlers, C. Cowles & Co., Water & Chestnut Sts., New Haven, Conn.

TUNGSTEN—lamps, Willard Storage Battery Co., Marquette Road & Lakeside, Cleveland, O.  
 TURNER—tire pumps & bilge pumps, The Turner Brass Works, Sycamore, Ill.  
 TURNEY—reamers, Grant Nail & Supply Co., Boston, Mass.  
 TURTLE NECK—gauntlets, American Glove Co., 18 Churchill St., Chicago, Ill.  
 TUTTLE—gasoline marine motors, D. M. Tuttle & Co., Canastota, N. Y.  
 20TH CENTURY—acetylene gas generators & cycle & motorcycle lamps, 20th Century Lamp Co., 19 Warren St., N. Y. City.  
 \*20TH CENTURY—current rectifiers, Dimond Igniter Co., 2231 Broadway, N. Y. City.  
 20TH CENTURY—gasoline marine motors, New York Yacht, Launch & Engine Co., Morris Heights, N. Y. City.  
 20TH CENTURY—glue-cement, L. W. Ferdinand & Co., 201 South St., Boston, Mass.  
 20TH CENTURY—seats, F. W. Anderson & Co., Brown & Uber Sts., Phila., Pa.  
 TWENTIETH CENTURY—tire protectors, The Perkins-Campbell Co., 622 Broadway, Cincinnati, O.  
 20TH CENTURY—tire protectors & blow out patches, 20th Century Tire Protector Co., Midlothian, Tex.  
 20TH CENTURY—tool boxes, F. G. Marbach, Medina, Ohio.  
 TWICE-TWO—gasoline marine motors, The Twice-Two Cycle Engine Co., Inc., 24 S. Canal St., Chicago, Ill.  
 TWIN GRIP—wrenches, Twin Grip Wrench Co., 25 Old Slip, N. Y. City.  
 TWITCHELL—air gauge for tires, W. D. Newerf Rubber Co., 949 S. Main St., Los Angeles, Cal.  
 TWO BELT SYSTEM—polishing machines, John C. Blevney, 216-224 High St., Newark, N. J.  
 2K—universal grinders, O. S. Walker & Co., 25 Union St., Worcester, Mass.  
 TWO PORT—carburetors, Allen Fire Dept. Supply Co., Eddy St., Providence, R. I.  
 TWO-RUB—metal polish, Two-Rub Metal Polish Co., St. Louis, Mo.  
 TYCOS—aneroid barometers & gasoline hydrometers, Taylor Instrument Companies, Rochester, N. Y.  
 TYREZE—tire talc, Binney & Smith Co., 81-83 Fulton St., N. Y. City.

## U

U—wiping rags, John R. Lyman Co., 119 Liberty St., Springfield, Mass.  
 U & H—magnetos, J. S. Bretz Co., 1004 Times Bldg., New York City.  
 U. S. G. CO.'S—graphite, pipe joint compounds & grease, U. S. Graphite Co., Saginaw, Mich.  
 U. V.—magnetos, imported by The Motor Car Equipment Co., 55 Warren St., N. Y. City.  
 U-AUTO—wood polish, United Supply Agency, 912 Westminster St., Providence, R. I.  
 UKO—spark plugs, The Utility Co., 636-638 W. 44th St., N. Y. City.  
 ULRICH—gasoline auto & marine motors, J. M. Ulrich, Greenwich, Conn.  
 ULTRA—oil hand soap, White Refining Co., 77 Main St., Buffalo, N. Y.  
 ULTRA CAPITAL—steels, imported by Geo. Nash Co., 217 Pearl St., N. Y. City.  
 UMPH—distributors & timers, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.  
 \*UNCLE SAM—gasoline marine motors, Kumberger & Vreeland, Inc., 33-35 Sullivan St., N. Y. City.  
 UNCLE SAM—metal & wood polish, Uncle Sam Polish Co., 335 Monroe Ave., Detroit, Mich.  
 UNEEDIT—hand cleansing compound, W. H. Cross & Ladd Co., 29 Murray St., N. Y. City.  
 UNEEDME—tire repair tools, "Unneedme" Tool Co., Bottles & Factory Sts., Columbus, O.  
 U-NEEK—oils, Manhattan Oil Co., 51 Front St., N. Y. City.

UNION—chucks, Union Mfg. Co., New Britain, Conn.  
 UNION—cushion springs, E. Kelley & Co., 509 Main St., Worcester, Mass.  
 UNION—hack saw frames, Union Hardware Co., Torrington, Conn.  
 UNION—enamels, imported by Holland Enamel & Paint Co., 142 Fulton St., N. Y. City.  
 UNION—ignition batteries, pocket ammeters & inspection lamps, Union Battery Co., Belleville, N. J.  
 UNION—jacks & anti-skid chains, Union Elevator & Machine Co., 215-17 W. Ontario St., Chicago, Ill.  
 \*UNION—metal cement & soldering solution, Union Metal Cement Co., Northport, Long Island, N. Y.  
 UNION—screw drivers, Geo. E. Gay, Augusta, Me.  
 UNION—twist drills, Union Twist Drill Co., Athol, Mass.  
 UNION—varnish, Holland Enamel & Paint Co., 142 Fulton St., N. Y. City.  
 UNION—wind shields, Pittsburg Auto Equipment Co., Baum St., Pittsburg, Pa.  
 UNISPARKER—spark generator, Atwater-Kent Mfg. Works, 42-46 N. 6th St., Phila., Pa.  
 \*UNITED—brass, bronze & aluminum castings, valves & cocks, United Brass Mfg. Co., Cleveland, Ohio.  
 U. S.—automobile jacks, U. S. Jack Co., 644 W. Lake St., Chicago, Ill.  
 U. S.—metal polishes, Geo. Wm. Hoffman, 549 E. Washington St., Indianapolis, Ind.  
 U. S.—pliers & hand punches, P. Lowentraut Mfg. Co., Newark, N. J.  
 UNITED STATES—tool holders, Fairbanks Co., Springfield, Ohio.  
 UNIVERSAL—ball bearings, United Bearings Co., Bradford, Pa.  
 UNIVERSAL—bumpers, Western Brass Mfg. Co., 21st & Campbell Aves., Chicago, Ill.  
 UNIVERSAL—burners, M. Kirchberger & Co., 339 Broadway, N. Y. City.  
 UNIVERSAL—combination forge, anvil, drilling machine, vise, bench, mill, pipe jaw & blowpipe, Henry Ducasse & Co., 735 7th Ave., N. Y. City.  
 UNIVERSAL—drill presses, Millers Falls Co., 28 Warren St., N. Y. City.  
 UNIVERSAL—grease, Warren Lubricant Co., Buffalo, N. Y.  
 UNIVERSAL—grease, Keystone Oil & Supply Co., Inc., Pittsburg, Pa.  
 UNIVERSAL—hack saw blades, hack saw frames & power hack saws, West Haven Mfg. Co., 22 Elm St., New Haven, Conn.  
 UNIVERSAL—hardware (auto), Western Brass Mfg. Works, 21st & Campbell Aves., Chicago, Ill.  
 UNIVERSAL—ignition batteries, vehicle batteries & electric auto lamps, Universal Electric Storage Battery Co., 301-09 N. Peoria St., Chicago, Ill.  
 \*UNIVERSAL—oils, T. T. Southwick, 19 Upton Park, Rochester, N. Y.  
 UNIVERSAL—polishing wheels, Hanson & Van Winkle Co., Newark, N. J.  
 UNIVERSAL—pneumatic dusting device, Electric Motor & Equipment Co., 230 Market St., Newark, N. J.  
 UNIVERSAL—reels, Emil Grossman Co., 232 W. 58th St., N. Y. City.  
 UNIVERSAL—removable rims, Universal Removable Rim Co., 1301 Michigan Ave., Chicago, Ill.  
 UNIVERSAL—rubber matting, Boston Belting Co., 256-60 Devonshire St., Boston, Mass.  
 \*UNIVERSAL—tire brackets, Auto Rail & Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.  
 UNIVERSAL—tire inflating tanks, acetylene gas generators, foot rests, robe rails, tire holders, grease & oil guns, lamps & horns, New York Coach & Auto Lamp Co., 791-98 Tenth Ave., N. Y. City.  
 UNIVERSAL—tire removers, Universal Auto Tire Remover, 948 Market St., Room 411, San Francisco, Cal.  
 UNIVERSAL—tire sleeves & tire threads, Universal Tire Protector Co., Angola, Ind.

- UNIVERSAL—tool holders, Van Doren Mfg. Co., 557-61 W. Jackson Blvd., Chicago, Ill.
- UNIVERSAL—turn tables & emery grinders, Canton Foundry & Machine Co., 8th & Saxton Sts., Canton, Ohio.
- UNIVERSAL—wind shields, chime valves, chime horns & foot pedals for operating chime horns, Universal Wind Shield Co., 130-34 S. Clinton St., Chicago, Ill.
- UNIVERSAL—wood workers' vises & machinists' vises, Emmert Mfg. Co., Waynesboro, Pa.
- UNIVERSAL — wrenches, Edmonds-Metzel Mfg. Co., 1910-20 Kinzie St., Chicago, Ill.
- UNIVERSAL FLUXINE—brazing compound, & UNIVERSAL SOLDERING FLUID—solder, Universal Fluxine Co., Urbana, Ohio.
- UNIVERSAL METAL PUTZ POMADE—metal polish, American Metal Polish Co., 89 Winslow Ave, West Somerville, Mass.
- UNTERBERG & HELMLE—master magnetos, imported by J. S. Bretz Co., 1004 Times Bldg., N. Y. City.
- USE-EM-UP—sockets & sleeves, American Specialty Co., 834-35 Monadnock Bldg., Chicago, Ill.
- UTICA—fire extinguishers, O. J. Childs Co., 48 & 50 Liberty St., Utica, N. Y.
- UTICA—nippers & pliers, Utica Drop Forge & Tool Co., 800 Whitesboro St., Utica, N. Y.
- UTILITY—hack saw blades, hack saw frames & band saws, West Haven Mfg. Co., 22 Elm St., New Haven, Conn.
- UTILITY—spark plugs & metal polish, Utility Co., 636-638 W. 44th St., N. Y. City.
- V**
- V. D.—case hardening compounds, Van Doren Mfg. Co., 557-61 W. Jackson Blvd., Chicago, Ill.
- V. D.—drilling machines, American Specialty Co., 834-35 Monadnock Bldg., Chicago, Ill.
- V & O—presses, The V & O Press Co., Glendale, L. I., N. Y.
- \*VACUUM—grease, Vacuum Oil Co., Rochester, N. Y.
- VALENTINE—varnishes, paints & enamels, Valentine & Company, 257 Broadway, N. Y. City, also 277 Dearborn St., Chicago, Ill.
- VALSPAR—spar varnishes, Valentine & Company, 257 Broadway, N. Y. City, also 277 Dearborn St., Chicago, Ill.
- VALVELESS—inner tubes, Valveless Inner-Tube Co., 43-49 Exchange Pl., N. Y. City.
- VALVOLINE—oils & gear compounds, Valvoline Oil Co., 11 Broadway, N. Y. City.
- VALVONE—oils, A. G. Belden & Co., 145 Maiden Lane, N. Y. City.
- VANADIUM—varnish, Valentine & Company, 257 Broadway, N. Y. City, also 277 Dearborn St., Chicago, Ill.
- VAN—automobile jacks, Vanderpool Bros., Springfield, O.
- VAN BENSCHOTEN—clipper grinders, John Van Benschoten, 14-20 Catherine St., Poughkeepsie, N. Y.
- VANCO—hand soap, J. T. Robertson Co., Manchester, Conn.
- VANDERBEEK—scraping tools, Vanderbeek Tool Works, 622 Capitol Ave., Hartford, Conn.
- VAN DORN — factory equipment, The Van Dorn Iron Works Co., Cleveland, Ohio.
- \*VAN EPPS—gasoline marine motors, Gooley & Edlund, Syracuse, N. Y.
- VANGUARD—wind shields, bumpers, spark plugs, stampings, brass castings, lamp brackets, foot rails, robe rails, wood & metal polish, tire holders, The Vanguard Mfg. Co., Washington & Desplaines Sts., Joliet, Ill.
- VICTOR—air compressors, polishing & buffing machines & lathes, Victor Electric Co., 55-61 Market St., Chicago, Ill.
- VARNI-COTE—wood polish, Shi-Nal Co., 413 Emmet Road, Toledo, Ohio.
- VARNO VIM—automobile body soap, Standard Leather Washer Mfg. Co., 24-26 Boudinot St., Newark, N. J.
- VASCO—wind shields, bumpers, hand soap, foot rests, robe rails, tire holders, lamp brackets, spark plugs & valve grinding compounds, Victor Auto Supply Mfg. Co., 42 W. 43rd St., N. Y. City.
- VEEDER—cyclometers, tachometers, odometers, revolution counters & tachodometers, Veeder Mfg. Co., Sargeant & Garden Sts., Hartford, Conn.
- VEEDER METAL—fine castings, Veeder Mfg. Co., Sargeant & Garden Sts., Hartford, Conn.
- VELOCITY—automobile oils, G. W. Gallaway, 322 Pearl St., N. Y. City.
- VELOGRAPH—vehicle recorder, imported by National Sales Corporation, 296 Broadway, N. Y. City.
- VELOX—high speed tool steel & twist drills, imported by F. R. Phillips & Sons Co., Penn Bldg., Phila., Pa.
- VELOX—timers, distributors & magnetos, Philadelphia Timer & Machine Co., 328 Vine St., Phila., Pa.
- VELOX—chain blocks, Alfred H. Schutte, 90 West St., N. Y. City.
- VELOX—inner tubes & metal polish, Manufacturers' Supplies Co., 418 Arch St., Philadelphia, Pa.
- VELOX—oils, Pennsylvania Oil Works Co., 1771 Broadway, N. Y. City.
- VELS-MA—metal polish, Rex Chemical Co., 104 S. Howard St., Baltimore, Md.
- VELVET—shock absorbers, Phillips Mfg. Co., 60 Wall St., N. Y. City.
- VENTNOR—motor boats, Adolph E. Apel, Ventnor, Atlantic City, N. J.
- VENUS—electric auto lamps, C. T. Ham Mfg. Co., Rochester, N. Y.
- VENUS—spark plugs, The R. E. Hardy Co., 201 37th St., Brooklyn, N. Y.
- VERIBEST—spark coils, Tritt Electric Co., Union City, Ind.
- VERNOSITE—varnishes, F. W. Devoe & C. T. Reynolds Co., Fulton & William Sts., N. Y. City.
- VESCO—tops & top dust hoods, Vehicle Top & Supply Co., 900 Cass Ave., St. Louis, Mo.
- VESTA—electric automobile lamps, ignition batteries & magnetos, Vesta Accumulator Co., 1336 Michigan Ave., Chicago, Ill.
- VESUVINE—aluminum paints, C. H. Chavant & Co., 203 Cator Ave., Jersey City, N. J.
- VESUVIUM—spark plugs, A. R. Mosler & Co., 163 W. 29th St., N. Y. City.
- VIAN'S AUTO GRIP—pipe wrenches, Syracuse Wrench Co., Franklin & Water Sts., Syracuse, N. Y.
- VICTOR—acetylene gas tanks, The Compressed Gas Tank Co., Canton, Mass.
- VICTOR—air compressors, garage tire pumps current rectifiers, polish & buffing machines & lathes, Victor Electric Co., 56-61 Market St., Chicago, Ill.
- VICTOR—anti-skid devices, Victor Tire Traction Co., 16 State St., Boston, Mass.
- \*VICTOR—automobile engine starters, Victor Mfg. Co., Station A, Detroit, Mich.
- VICTOR—bow separators, The Victor Rubber Co., Springfield, Ohio.
- VICTOR—brake compounds & trunk racks, Victor Clutch Compound Co., Nashua, N. H.
- VICTOR—ferrules, Bay State Stamping Co., 380 Chandler St., Worcester, Mass.
- \*VICTOR — gasoline marine engines, R. S. Hill, 24 E. Woodbridge St., Detroit, Mich.
- VICTOR—hack saw blades, hack saw frames & nail sets, Massachusetts Saw Works, Chicopee, Mass.
- VICTOR—hand punches & shears, Novelty Iron Works, Dubuque, Iowa.
- VICTOR—ignition batteries & spark plugs, Milwaukee Auto Specialty Co., 134 Second St., Milwaukee, Wis.

VICTOR—nut facing machines, Victor Tool Co., Waynesboro, Pa.  
 VICTOR—oil cups & valves, The Lunkenheimer Co., Cincinnati, O.  
 VICTOR—power hack saws, Dayton Machine Works, Dayton, O.  
 VICTOR—ratchet foot levers, Reading Automobile Co., 26-28 S. 5th St., Reading, Pa.  
 VICTOR—rivets, Champion Rivet Co., Rice Ave. & Erie R. R., Cleveland, Ohio.  
 VICTOR—screw drivers, John Stortz & Son, 210 Vine St., Phila., Pa.  
 VICTOR—spark plugs, Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.  
 VICTOR—stationary engines, The Alamo Mfg. Co., Hillsdale, Mich.  
 \*VICTOR—top dressing & wood polish, The Victor Mfg. Co., 72 Chestnut St., Newark, N. J.  
 VICTOR—vanadium bronze & alloys, Victor Metals Co., E. Braintree, Mass.  
 VICTOR—wrenches, alligator, Kraeuter & Co., Inc., 571-79 18th Ave., Newark, N. J.  
 VICTOR—wrenches & pliers, C. E. Bonner Mfg. Co., Chrisman, Ill.  
 VICTOR VANADIUM—castings, forgings, bronze bearings, axles & gears, Vanadium Metals Co., Frick Bldg., Pittsburg, Pa.  
 VICTORY—burners, M. Kirchberger & Co., 339 Broadway, N. Y. City.  
 VIGILANT—oil automobile lamps, C. T. Ham Mfg. Co., Rochester, N. Y.  
 VIM—bicycles, cycle tires & trouser guards, Vim Cycle & Hardware Co., 228-230 Broadway, Buffalo, N. Y.  
 VIM—gasoline marine motors & gasoline auto engines, The Vim Motor Mfg. Co., Market & Hancock Sts., Sandusky, O.  
 VIM—magnetos, Tritt Electric Co., Union City, Ind.  
 VIM—leather for clutches, brakes & tires, E. F. Houghton & Co., 240 W. Somerset St., Phila., Pa.  
 VISCOS—oils, grease & graphite grease, National Oil & Supply Co., First & Essex Sts., Newark, N. J.  
 \*VISOR—woolen hood & muffler for neck, head & chest, Visor Knitting Company, Main St. Court, Niagara Falls, N. Y.  
 VITA—ignition batteries, metal & wood polish, Vita Mfg. Co., 1151-57 Stanford Ave., Los Angeles, Cal.  
 VITRIFIED—oil stones, emery, corundum & carborundum wheels & tool grinders, Vitri-fied Wheel Co., Westfield, Mass.  
 VIVAX—ignition & propulsion batteries, lamp lighting batteries & rheostats for charging batteries, Vivax Storage Battery Co., 2224-2234 Michigan Ave., Chicago, Ill.  
 VIXEN—files & milling tools, The National File & Tool Co., 2110 Allegheny Ave., Phila., Pa.  
 \*VOLCANO—brazing & heating torches, Volcano Torch & Mfg. Co., 237 E. 22nd St., Erie, Pa.  
 VOLCANO—spark plugs, The Zenith Motor Goods Co., 1841 Euclid Ave., Cleveland, Ohio.  
 VOLCANO—spark plugs, Volcano Spark Plug Co., Ashland, Ohio.  
 VOLIER—horns, imported by American Brass Products Co., Hartford, Conn.  
 VOLKCAR—ignition, storage & lighting batteries & electric automobile lamps, Volk-car Storage Battery Co., 2441-2443 Michigan St., Chicago, Ill.  
 VOLTA—automobile clocks, Harry Eisner & Co., 29 Scotia St., Boston, Mass.  
 VOLTA—magnetos, Buffalo Ignition Co., 41-43 E. Eagle St., Buffalo, N. Y.  
 VOLTZ—wind shields, Limousine Carriage Mfg. Co., 3515 Michigan Ave., Chicago, Ill.  
 VON SCHWARZ—burners & lava tips, M. Kirchberger & Co., 339 Broadway, N. Y. City.  
 \*VREELAND—stationary engines, Kumberger & Vreeland, Inc., 33-35 Sullivan St., N. Y. City.  
 VULCABESTON—gaskets, H. W. Johns-Manville Co., 100 William St., N. Y. City.  
 \*VULCAN—gasoline marine motors, Vulcan Engine Works, 1727 Ludlow St., Phila., Pa.

VULCAN, VULCAN SPECIAL, VULCAN XX—iron, Lockhart Iron & Steel Co., Pittsburg, Pa.  
 VULCAN—lubricators, The Lunkenheimer Co., Cincinnati, O.  
 VULCAN—paints, Bronze Powder Works Co., Elizabeth, N. J.  
 VULCAN—screw drivers, H. H. Mayhew Co., Shelburne Falls, Mass.  
 VULCAN—welding compound, Cortland Welding Compound Co., Cortland, N. Y.  
 VULCAN-BRAZER—brazing forges, Black Diamond Saw & Machine Works, Natick, Mass.  
 VULCANOID—engine packings, Thermoid Rubber Co., Trenton, N. J.  
 VULCANOID—vulcanizing solutions, Hazen-Brown Co., 100 South St., Boston, Mass.  
 VULCO-NU-TREAD—tire cements, Hazen-Brown Co., 100 South St., Boston, Mass.

## W

W-D—tires, W-D Spring Cushion Tire Co., 107 W. 27th St., N. Y. City.  
 W. & E. CABINET—oil storage outfits, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.  
 W. & E. CONE—oil storage outfits, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.  
 W. F.—aluminum solder, U. S. Reduction Co., Chicago, Ill.  
 W. H. & CO.—varnishes, colors & engine enamels, Wadsworth-Howland Co., 84 Wash St., Boston, Mass.  
 W & S—magnetos, Wheeler & Schebler, Shelby, Barth & Sanders Sts., Indianapolis, Ind.  
 WABASH—cycle tires, Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.  
 WACKENHUTH—carburetors, Wackenhuth Carburetor Co., 26 Hackett St., Newark N. J.  
 \*WAGENHALS—heaters, Wagenhals Mfg. Co., 4569 Washington Ave., St. Louis, Mo.  
 WAHOO—tire protectors, Wahoo Auto Tire Protector Co., Wahoo, Neb.  
 WAITE SUCCESS—dry ignition batteries, Waite Auto Supply Co., 17 Dorrance St., Providence, R. I.  
 WALD—tire repair tools & pedal rubber, Wald Mfg. Co., Sheboygan, Wis.  
 WALDEN—ratchet wrenches, Walden Manufacturing Co., 65 Beacon St., Worcester, Mass.  
 WALKER—anti-skid devices & tire protectors, Walker Auto Tire Band Co., 18-24 South East St., Indianapolis, Ind.  
 WALKER—road maps, guides & atlases, Walker Lithograph & Publishing Co., 400 Newbury St., Boston, Mass.  
 WALKER—magnetic chucks, O. S. Walker & Co., 25 Union St., Worcester, Mass.  
 WALLWORK—lamp brackets for garages, Wells Light Mfg. Co., 154 Chestnut Ave., Jersey City, N. J.  
 \*WALNUT—gasoline marine motors, Walnut Machine & Brass Foundry Co., 316 Walnut St., Toledo, Ohio.  
 WALPOLE—tire tape, insulating tape, bumpers & rubber matings, Walpole Rubber Works, Walpole, Mass.  
 \*WALTERS—mechanical tire inflators, General Mechanical Co., 1029 Real Estate Trust Bldg., Phila., Pa.  
 WALTON—tap extractors & tool holders, The Walton Co., 306 Pearl St., Hartford, Conn.  
 WALWORTH—dies & taps, Walworth Mfg. Co., 128 Federal St., Boston, Mass.  
 WARD—gear grinding machines, Gear Grinding Machine Co., Detroit, Mich.  
 WARD LEONARD—rheostats, resistances & circuit breakers & electric lighting outfits, The Ward-Leonard Electric Co., 12 Swain St., Bronxville, N. Y.  
 WARNER—automobile tops & tool bags, Warner Pole & Top Co., 1648 Centre Ave., Cincinnati, Ohio.



- WARNER—cut meters & tachometers, Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis.
- WARNER—steering devices, compensating gears, clutches & levers, Warner Gear Co., Muncie, Ind.
- WARNER AUTO-METER—speed indicators, Warner Instrument Co., 628 Wheeler Ave., Beloit, Wis.
- WARNER & NOBLE—hand hammers, Warner Hammer Co., Cromwell, Conn.
- WARREN—universal joints, The Mutual Machine Co., 25 Wells St., Hartford, Conn.
- WARREN'S ALRIGHT—protection tip hose nozzle, Marion Warren Co., P. O. Box 45, Rochester, N. Y.
- WASCO—inner tube patches, Waite Auto Supply Co., 17 Dorrance St., Providence, R. I.
- WASHBURN—sensitive drills & lathes, The Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.
- WASHBURN—tire pressure registers, Judd & Leland Mfg. Co., Clifton Springs, N. Y.
- WASHEZY—hand soap, The R. M. Hollingshead Co., Camden, N. J.
- WASHITA—oil stones, Pike Mfg. Co., Pike, N. H.
- WASHZUM—car soap, The White & Bagley Co., Worcester, Mass.
- WAT—gasoline auto & marine engines, Lauth Auto & Engine Co., 769 Water St., Port Huron, Mich.
- WATAWATA—V belts, imported by Royal Motor Works Co., Worcester, Mass.
- WATERBURY—bolt & nut machinery, drop & power hammers, power presses, power shears & lathes, Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- WATERHOUSE—carburetors & autogenous welding plants, The Waterhouse Company, 6 Pelham St., Boston, Mass.
- \*WATERSHED CHROME—leather belting, J. E. Rhoads & Sons, 12 N. 3rd St., Phila., Pa.
- \*WATERSHED OAK—leather belting, J. E. Rhoads & Sons, 12 N. 3rd St., Phila., Pa.
- WATERTITE—automobile tire cases, The Post & Lester Co., 20 Sargeant St., Hartford, Conn.
- WATERTITE—wireless battery holders for motor boats, Stanley & Patterson, 23 Murray St., N. Y. City.
- WATERTOWN—gasoline marine motors, Watertown Motor Co., 112 Moulton St., Watertown, N. Y.
- \*WATERWEB—hat protectors, Robert G. Wallace Co., 496 Washington St., Boston, Mass.
- WATT—gasoline marine motors, Watt Motor Co., 564 Porter St., Detroit, Mich.
- WAUKESHA—gasoline automobile motors, The Waukesha Motor Co., Waukesha, Wis.
- \*WAVERLY—gasolines, Waverly Oil Works, Pittsburg, Pa.
- \*WAVERLY SPECIAL—oils, Waverly Oil Works, Pittsburg, Pa.
- \*WAXALENE—wood polish, Leader Mfg. Co., 1808 Chestnut St., St. Louis, Mo.
- WAY—mufflers & sweater coats, The Way Muffler Co., 23rd & Arch Sts., Phila., Pa.
- \*WAYNE—fire extinguishers, Wayne Chemical Co., Detroit, Mich.
- WAYNE—fuel or water tanks, gasoline & oil storage tanks & pumps, Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.
- WAYNE—gasoline storage tanks, Motor Accessories Co., 43 Cortlandt St., N. Y. City.
- \*WAYNE—stationary engines, Fort Wayne Foundry & Machine Co., Fort Wayne, Ind.
- WEAR-WELL—anti-skid chains, Cleveland Chain & Mfg. Co., Cleveland, O.
- \*WEARWELL—grips, Haverford Grip Co., 829 Arch St., Phila., Pa.
- WEBB—flexible shafts & belts, Webb Mfg. Co., Front & Centre Sts., Newark, N. J.
- WEBBER—hand knit jackets, George F. Webber, Station F., Detroit, Mich.
- WEBER—turn-table trucks, Weber Cycle & Supply Co., 6 E. Kiowa St., Colorado Springs, Col.
- WEBER—stationary engines & air compressors, Weber Gas Engine Co., Kansas City, Mo.
- WEBSTER—cluster lamp guards, Frank W. Morse, 516 Atlantic Ave., Boston, Mass.
- \*WEBSTER—mufflers, Webster Muffler Co., Galesburg, Ill.
- WEBSTER—tank level indicators, Randall-Faichney Co., 251 Causeway St., Boston, Mass.
- WEBSTER-MILTON—magnetos, Webster Electric Co., 1645 Old Colony Building, Chicago, Ill.
- WECKLER—gasoline motor boats, Weckler Boat Co., Chicago, Ill.
- WECO—gasoline marine engines, C. T. Wright Engine Co., 1005 Speed St., Greenville, Mich.
- WEBBER—mufflers for automobile engines, shock absorbers & wheel puller & valve tools, C. F. Webber Mfg. Works, 170-172 Central Ave., Albany, N. Y.
- WEED—tire chains (anti-skids), Weed Chain Tire Grip Co., 28 Moore St., N. Y. City.
- \*WEISS—curtain fasteners, Hercules Auto Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill.
- WEISS—curtain fasteners, Chas. Weiss & Son, 4800 Cottage Grove Ave., Chicago, Ill.
- WELLINGTON—gasoline torches, Wellington Mfg. Co., 18 & 20 Oak St., N. Y. City.
- WELLS—wrenches, pipe cutters, pipe vices, screw machines, tapping machines, reamer & cutter grinders, F. C. Wells & Son Co., Co., Chicago, Ill.
- WELTON—auto bumpers, The Welton Automobile Fender Co., 518 Columbus Savings & Trust Bldg., Columbus, O.
- WEMCO—gasoline auto motors, Wood Electric & Mfg. Co., Garst St. & Vandalia Tracks, South Bend, Ind.
- WEST—hydraulic tire setter, West Tire Setter Co., 143 Cutler Bldg., Rochester, N. Y.
- WESTCHESTER—sparking coils, spark plugs, ignition batteries & taximeters, Westchester Appliance Co., 13-15 Canal Place, Bronx Borough, N. Y.
- WESTCOTT—lathe chucks, Westcott Chuck Co., Oneida, N. Y.
- WESTCOTT—wrenches, Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y.
- WESTEN—shock absorbers, Westen Mfg. Co., 290 Halsey St., Newark, N. J.
- WESTERFIELD—gasoline auto & marine motors & gasoline stationary engines, The Anderson Motor Co., 16th & Jackson Sts., Anderson, Ind.
- WESTERN—foot rests, robe rails, rear sight mirrors & extra tire holders, Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal.
- WESTERN—gasoline storage outfits, Western Oil Pump & Tank Co., 2437 Kosciuszko St., St. Louis, Mo.
- WESTERN—oxy-acetylene welding plants, Western Welding & Mfg. Co., 557 W. Jackson Blvd., Chicago, Ill.
- WESTERN—radial drills, Western Machine Tool Works, Holland, Mich.
- WESTERN CHIEF—forges, pressure blowers, countershafts, tuyere irons, drill chucks & upright drills, Canedy-Otto Mfg. Co., Chicago Heights, Ill.
- WESTERN KINGSLEY—glass wind shields, Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal.
- WESTERN SPHERICAL—acetylene auto lamps, Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal.
- WESTERN UNIVERSAL—glass wind shields, Western Mechanical Works, 1138 S. Main St., Los Angeles, Cal.
- F. WESTFAHL & CO.—files & rasps, F. Westfahl & Co., Milwaukee, Wis.
- WESTFIELD—bicycles, The Pope Mfg. Co., Hartford, Conn.
- WESTINGHOUSE—belt, steam & motor driven air compressors, Westinghouse Air Brake Co., Pittsburg, Pa.
- WESTINGHOUSE—electric automobile motors, Westinghouse Electric & Mfg. Co., Pittsburg, Pa.



- WESTINGHOUSE—motors, Westinghouse Electric & Mfg. Co., Pittsburg, Pa.
- WESTINGHOUSE—storage ignition batteries & battery supplies, Westinghouse Storage Battery Co., Boonton, N. J.
- WESTMACOTT—furnaces, Westmacott Gas Furnace Co., 68 Clifford St., Providence, R. I.
- WESTMAN—gasoline marine & stationary motors, boat propellers, gears, timers & distributors, Enterprise Machine Co., 1114-22 S. 3rd St., Minneapolis, Minn.
- WESTON—drilling machines & ratchet drills, Keystone Mfg. Co., 41-51 Chandler St., Buffalo, N. Y.
- WESTON—voltmeters, ammeters & electrical measuring meters, Weston Electric Instrument Co., Waverley Park, Newark, N. J.
- WESTON-MOTT—steel rims, Weston-Mott Co., Flint, Mich.
- WE STOP RAIN—rain coats, Sanborn Mfg. Co., 151-155 W. 25th St., N. Y. City.
- \*WESTRUMITE—liquid for laying dust & for road making, Westrumite Co. of America, 1117 Monadnock Block, Chicago, Ill.
- WEST'S ENAMEL—top dressing, West Mfg. Co., 120 N. Madison St., Rockford, Ill.
- WHALEBONE—automobile wheels, Imperial Wheel Co., Flint, Mich.
- \*WHALEN—lock switches, Whalen Lock Co., 293 Johnson Ave., Jersey City, N. J.
- WHEELER—bicycle saddles, grips & bicycles, Wolverine Leather Goods Co., 51-59 Fort St., E., Detroit, Mich.
- WHEELER—wood filler, The Bridgeport Wood & Finishing Co., New Milford, Conn.
- WHICH WAY—spirit levels, C. G. Smith & Co., Columbia, Pa.
- WHIRL-A-GIG—radiator ornaments, C. L. Williams, 312 Halsey St., Newark, N. J.
- WHISLER—magnetos and dual ignition system, Whisler Mfg. Co., Port Huron, Mich.
- WHITAKER—wrenches, The Whitaker Mfg. Co., 509 W. Monroe St., Chicago, Ill.
- WHITE—gasoline motor boats, E. M. White Co., Oldtown, Me.
- \*WHITE—marine gasoline engines & stationary engines, Globe Iron Works Co., Menominee, Wis.
- \*WHITE—pneumatic automobile tires, White Co., 649 St. Nicholas Ave., N. Y. City.
- WHITE—valve lifting tools and inspection lamps, The Flexible Valve Remover Co., 12 Beverly St., Providence, R. I.
- WHITE—varnishes, American Varnish Co., 1140 N. Branch St., Chicago, Ill.
- WHITE COLUMBIA COLORING & WHITE ROSE—buffing & polishing compounds, Frederic B. Stevens, Detroit, Mich.
- WHITE-DIAMOND—buffing & polishing compounds, Matchless Metal Polish Co., N. Y. City.
- WHITEHALL—gasoline motor boats & marine & automobile engines, Whitehall Motor & Boat Co., Whitehall, N. Y.
- \*WHITENE—hand & auto body cleansing compounds, W. R. Robinson, Foot Essex St., Jersey City, N. J.
- WHITE PYRAMID—matting, Hamilton Rubber Mfg. Co., Trenton, N. J.
- WHITE ROYALINE—automobile oils, E. D. Ellis Oil Co., 213 Jefferson Ave., Detroit, Mich.
- WHITE STAR—ignition batteries, dry, White Star Battery Co., 126 Chambers St., N. Y. City.
- WHITING AIRBURETOR-FILTER—air filter & WHITING AIRBURETOR-MIXER—mixing valves, The Garlock Auto Specialty Co., Palmyra, N. Y.
- WHITLOCK—radiators, The Whitlock Coil Pipe Co., Hartford, Conn.
- WHITNEY—automobile chains, chain belts, adjustable pulleys, milling machines, grinders, keys & cutters for the Woodruff Patent Keying System, The Whitney Mfg. Co., Hartford, Conn.
- WHITNEY—punches, hand, W. A. Whitney Mfg. Co., Rockford, Ill.
- WHITTAKER—antiskid chains, Whittaker Chain Tread Co., 12 Pearl St., Boston, Mass.
- WHIZ—cup grease, automobile top dressing & metal polish, The R. M. Hollingshead Co., Camden, N. J.
- WHIZ—hand cleansing compound, J. P. Davies Co., Dayton, Ohio.
- WHIZOIL—oil & soap, The R. M. Hollingshead Co., Camden, N. J.
- WICO—plugs, switches, timers, ignition cable, charging apparatus, lamp adapters, electric auto lamps, igniters & inspection lamps, Witherbee Igniter Co., Springfield, Mass.
- WIDMAYER'S—combined motorcycle stand & luggage carrier, F. B. Widmayer Co., 2312 Broadway, N. Y. City.
- WILES—tire sleeves, Diamond Rubber Co., Akron, Ohio.
- WILEY—oil storage outfits, New York Oil Cabinet Co., 221 Front St., N. Y. City.
- WILKINSON—engine starters, J. Franklin Wilkinson, 7 Riggs St., Gloucester, Mass.
- WILLE—pistons, Wille Piston Works, 17 Herkimer Place, Brooklyn, N. Y.
- WILLET—carburetors, gasoline automobile & marine engines, The Willet Engine & Carburetor Co., 764 Ellicott Square, Buffalo, N. Y.
- WILLEY—electric automobile charging apparatus, motors for machines, tools, hack saws, drills, drill presses & grinders, James Clark, Jr., Electric Co., 520 W. Main St., Louisville, Ky.
- WILLIAMS—carburetors, gasoline lock valves & gasoline strainers, The Williams Carburetor Mfg. Co., 963 William St., Buffalo, N. Y.
- WILLIAMS—pipe cutting & threading machines, Williams Tool Co., Erie, Pa.
- WILLIAMS'—spark coils, plugs & switches, E. Q. Williams, 537 S. Clinton St., Syracuse, N. Y.
- WILLIAMS—wind shields, Twentieth Century Motor Car Co., 121-125 S. Lafayette St., South Bend, Ind.
- WILLIAMSPORT—stationary engines, Williamsport Gas Engine Works, Foot of Walnut St., Williamsport, Pa.
- WILLIAMS S-V—auto tire cement & WILLIAMS PLUG-IT—bicycle tire cement, Williams Mfg. Co., Camden, N. J.
- WILMINGTON—auto wheels, The Wilmington Wheel Mfg. Co., Wilmington, Del.
- WILSON—automobile luggage carriers, F. Cortez Wilson & Co., 239-241 Lake St., Chicago, Ill.
- WILSON—lamplighters, electric, H. K. Wilson Mfg. Co., New Bedford, Mass.
- WILSON—moulders' & automobile shovels, Wood Shovel & Tool Co., Piqua, Ohio.
- WILWEAR—foot rests, The Novelty Mfg. Co., Maple St., Waterbury, Conn.
- WINDSOR—spark plugs, C. H. Stoddard, 10 Waldo St., Worcester, Mass.
- WINESTOCK—spark plugs, Knapp-Greenwood Co., 1000 Boylston St., Boston, Mass.
- WINKLEY—oil hole covers, dowel pins & oil cups, The Winkley Co., 226 Abbot St., Detroit, Mich.
- \*WINNER—automobile bearings & raw material, Dean-Allan Mfg. Co., South Portland, Me.
- WINN'S—graphite, lemon polishing oils & cotton waste, W. R. Winn, 143 Malden Lane, N. Y. City.
- WINSHIP—trunks, lunch kits & leather pockets, W. W. Winship, 71 Summer St., Boston, Mass.
- \*WINTERTON—metal polish, W. W. Callery & Co., 36th & Butler Sts., Pittsburg, Pa.
- WIRELESS—Motor truck tires, The B. F. Goodrich Co., Akron, Ohio.
- WISCONSIN—gasoline auto & marine motors, Wisconsin Motor Mfg. Co., Dept. 21, North Milwaukee, Wis.
- WISCONSIN—stationary engines, The Lanson-Lawton Co., De Pere, Wis.

WISCONSIN VALVELESS—gasoline automobile engines & marine engines, Wisconsin Machinery & Mfg. Co., Canal St. & Muskego Ave., Milwaukee, Wis.

WISHBONE—auto tops, The Michigan Steel Boat Co., 1250-1500 Jefferson Ave., Detroit, Mich.

WISHBONE RIVAL—auto tops, Detroit Motor Car Supply Co., 1280 Jefferson Ave., Detroit, Mich.

WITHAM—charging panels & switchboards, electric safety lights & Tungsten lanterns, E. Marcuson, 521 W. 182nd St., N. Y. City.

WITHERBEE—ignition batteries & pocket voltmeters, Witherbee Igniter Co., Springfield, Mass.

WITHERBEE JR.—ignition batteries, Witherbee Igniter Co., Springfield, Mass.

T. H. WITHERBY—woodworkers' chisels, Winsted Edge Tool Works, Winsted, Conn.

WIZARD—bearing metals, Globe Metal Co., 401 W. Ontario St., Chicago, Ill.

WIZARD—drill chucks, The McCrosky Reamer Co., Meadville, Pa.

WIZARD—ignition batteries, Stackpole Battery Co., St. Mary's, Pa.

WIZARD—lathe chucks, William S. Nicholls, 253 Broadway, N. Y. City.

WIZARD—magnetos, Hercules Electric Co., 2128-2136 Northwestern Ave., Indianapolis, Ind.

WIZARD—stationary gasoline engines, Temple Pump Co., 17-27 W. 15th St., Chicago, Ill.

WIZARD—wrenches, The Richards Mfg. Co., Aurora, Ill.

WOHLFELD'S—auto trunks, S. Wohlfeld & Co., 538 N. 3rd St., Phila., Pa.

WOLVERINE—sheet brass & copper, brass rods, wind shield tubing, tubing & propeller shafts, Michigan Copper & Brass Co., Detroit, Mich.

WONDER—belt sanders, C. H. Driver, 1320 16th St., Racine, Wis.

WONDER—burner cleaners, A. Nelson Mfg. Co., 564 W. Randolph St., Chicago, Ill.

\*WONDER—gasoline marine engines, Wonder Mfg. Co., 249 Tallman St., Syracuse, N. Y.

WON'T SLIP—tires & bands, C. J. Bailey & Co., 22 Boylston St., Boston, Mass.

\*WOOD—lubricators, Geo. Wood Mfg. Co., 19 Canfield St., Newark, N. J.

WOOD—moulders' & automobile shovels, Wood Shovel & Tool Co., Piqua, Ohio.

WOODPECKER—stationary engines, The Middletown Machine Co., Middletown, Ohio.

WOODWORTH—tire protectors, emergency straps, tire sleeves, anti-skid devices & leather patches, Leather Tire Goods Co., Niagara Falls, N. Y.

WORCESTER—grinders, The Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

WORCESTER—spark coils, W. H. Leland & Co., Worcester, Mass.

WORDY—auto horn blowers, Wordingham Auto Supply Co., 803 Grand Ave., Milwaukee, Wis.

WORLD—bicycles, Arnold, Schwinn & Co., 1718-32 N. 43rd St., Chicago, Ill.

\*WRIDGEWAY NO GLARE—lamp shades, Wridgeway No Glare Shade Co., 1999 Broadway, N. Y. City.

WRIGHT—cooler & hoods, Wright Cooler & Hood Mfg. Co., 1545 Michigan Ave., Chicago, Ill.

\*WRIGHT—gasoline marine motors, Gasport Motor Co., Gasport, N. Y.

WRIGHT—spark plugs, New York Mica & Mfg. Co., 122 Clark St., Auburn, N. Y.

WRIGHT—wrenches, The Wright Wrench Mfg. Co., 922 S. Market St., Canton, O.

WUNDERBUTTON—acetylene burners, Wunderbutton Mfg. Co., 242 Lafayette St., N. Y. City.

\*WYMAN—tire inflating tanks, whistles & whistle outfits, The Auto Tire Inflating Co., 104 S. 8th St., Brooklyn, N. Y.

WYOMING—steam separators & traps, W. H. Nickolson & Co., Wilkes-Barre, Pa.

## X

X-F—files & rasps, Nicholson File Co., Providence, R. I.

X. L.—storage batteries, Kuehn & Metz, 1900 Broadway, N. Y. City.

X-L—valve grinding compound, J. F. Bornschein & Co., 2351 Indiana Ave., Chicago, Ill.

XL—hack saw blades, Henry G. Thompson & Son Co., New Haven, Conn.

XXX—polishing cloths, Continental Waste Co., 22 Clayton St., Boston, Mass.

XXX—wood polish, The Bobrick Chemical Co., 111-117 S. Garey St., Los Angeles, Cal.

XARGIL—vacuum mufflers & gasoline auto motors, Xargil Mfg. Co., 36-44 Broadway, Utica, N. Y.

XCELL—ignition batteries, The Englewood Carbon Works, Wabash Ave. & 65th St., Chicago, Ill.

XLCCR—ignition batteries, oils, spark plugs, gasoline auto engines, inspection lamps & tire repair tools, Excelsior Supply Co., 233-237 Randolph St., Chicago, Ill.

X-RADIUM—heaters, Novelty Mfg. Co., Jackson, Mich.

XTRA-SERVIS—tire protectors, American Tire Co., Owosso, Mich.

XX CENTURY—auto jacks, Joyce-Cridland Co., Dayton, Ohio.

XXXX—glue, Hanson & Van Winkle Co., Newark, N. J.

## Y

Y—folding seats, H. A. Buffington & Co., Berkshire, N. Y.

Y & T—electric & chain hoists, Yale & Towne Mfg. Co., 9 Murray St., N. Y. City.

YACHTING—automobile clothing & caps, Howard Place Co., 162 South St., N. Y. City.

YAGERS—soldering flux, Alex. R. Benson Co., Hudson, N. Y.

YALA—ratchet wrenches, Syracuse Wrench Co., Franklin & Water Sts., Syracuse, N. Y.

YALE—gasoline marine motors & air compressors, Baird Machine & Mfg. Co., 11-23 Raynor St., Detroit, Mich.

YALE—locks, padlocks & lock switches, Yale & Towne Mfg. Co., 9 Murray St., N. Y. City.

YALE—metal polish, Rostand Mfg. Co., Milford, Conn.

YAMA—grease, W. Sheppard, 141 E. 25th St., N. Y. City.

YANKEE—drill presses, Manville Bros. Co., Waterbury, Conn.

YANKEE—lathes, The Meriden Machine Tool Co., Meriden, Conn.

YANKEE—tire boots & sleeves, American Tire Co., Owosso, Mich.

YELLOW SEAL—varnishes, Eugene E. Nice, 272 S. 2nd St., Phila., Pa.

\*YEMCO—wrenches, York Electric & Machine Co., York, Pa.

YOST'S—machinists' vises, G. M. Yost Mfg. Co., Meadville, Pa.

YOUNG—cylinder oils, Frank L. Young & Kimball, 111 Purchase St., Boston, Mass.

YOUNG'S—oils & greases, Orlando W. Young, 174-180 Frelinghuysen Ave., Newark, N. J.

**Z**  
**ZACHARIAS**—lawn mower grinders, Zacharias Garage Co., Eagle Hall, Asbury Park, N. J.  
**ZAG**—anti-skid chains, Motor Appliance Co., 1438 Michigan Ave., Chicago, Ill.  
**ZAHN**—roller bearings, Detroit Roller Bearing Co., 198 Piquette Ave., Detroit, Mich.  
**ZEGLER**—puncture-proof automobile tires, Zeglen Bullet Proof Cloth Co., 1532-34 Michigan Ave., Chicago, Ill.  
**ZENITH**—grease & auto body soap, Pennsylvania Oil Works Co., 1771 Broadway, N. Y. City.  
**ZEROLENE**—oil, Standard Oil Co., Inc., Room 609, 26 Broadway, N. Y. City.  
**ZIG-ZAG**—wind shields, Chicago Wind Shield Co., 235 Johnson St., Chicago, Ill.

**ZIMMERMAN**—timers & quadrants, The Zimmerman-Smith Co., North Tonawanda, N. Y.  
**ZIMMERMAN**—wood & metal auto bodies & tops, F. F. Zimmerman & Sons, Wanpan, Wis.  
**ZIP**—metal cleaning felt, W. W. Reid Mfg. Co., 131 State St., Boston, Mass.  
**ZIRCON**—metal polish, Kertum Mfg. Co., 10-12 Pearl St., Buffalo, N. Y.  
**ZIZ**—hand soap, Byram Mfg. Co., Box 3133, Boston, Mass.  
**ZOAR**—ignition & vehicle batteries, The Zoar Battery Co., Zoar, Ohio.  
**ZURNOIL**—oils, The O. F. Zurn Co., Broad & Lehigh Ave., Phila., Pa.

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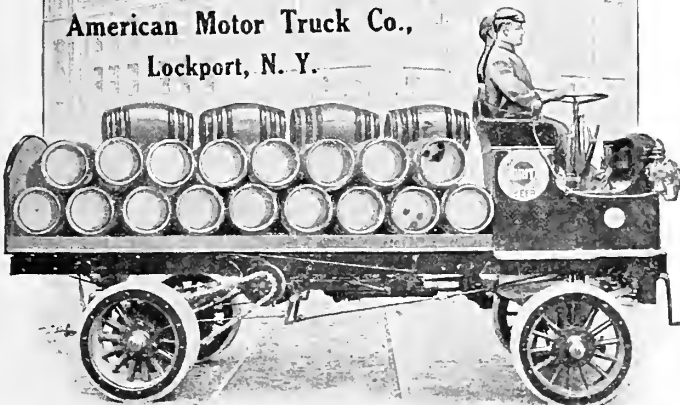
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**AMERICAN MOTOR TRUCK**

will do as much work as **three** of your teams. They are swift, sure and simple to operate.

Write to-day for detailed information.

**American Motor Truck Co.,**  
**Lockport, N. Y.**



# Section V

## TRADE ASSOCIATIONS

### IN THE

## Automobile, Motorcycle and Motor Boat Industry

### I. National Associations

#### NATIONAL ASSOCIATION OF AUTOMOBILE MANUFACTURERS (Incorporated)

Headquarters, 7 East 42nd Street, New York City

Object: The promotion of the interests of the automobile industry. Any established manufacturer of automobiles is eligible.

#### OFFICERS

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First Vice-President .....	Wm. E. Metzger
Second Vice-President .....	L. H. Kittredge
Third Vice-President .....	C. C. Hildebrand
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Treasurer .....	Wm. R. Innis
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General Manager .....	S. A. Miles

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Windsor T. White	H. O. Smith
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	C. G. Stoddard

GENERAL MANAGER OF TRAFFIC DEPARTMENT ..... J. S. Marvin

#### MEMBERS

James Joyce.....	American Locomotive Auto Co.	1886 Broadway, N. Y.
W. C. Anderson .....	Anderson Carriage Co.	Detroit, Mich.
Edgar Apperson .....	Apperson Bros. Automobile Co.	Kokomo, Ind.
W. S. Austin.....	Austin Automobile Co.	Grand Rapids, Mich.
David S. Ludlum .....	Autocar Co.	Ardmore, Pa.
F. A. Babcock .....	Babcock Electric Carriage Co.	Buffalo, N. Y.
Fred R. White .....	Baker Motor Vehicle Co.	Cleveland, O.
J. B. Bartholomew .....	The Bartholomew Co.	Pcoria, Ill.
Frank Briscoe .....	Brush Runabout Co.	Detroit, Mich.
W. C. Durant .....	Buick Motor Car Co.	Jackson, Mich.
W. C. Leland .....	Cadillac Motor Car Co.	Detroit, Mich.
Lee Counselman .....	Chalmers-Detroit Motor Co.	Detroit, Mich.
J. R. Vandever .....	Commercial Motor Co.	49 W. 66th St., N. Y.
H. W. Nuckols .....	Columbia Motor Car Co.	Hartford, Conn.
M. S. Hart .....	Corbin Motor Vehicle Corp'n.	New Britain, Conn.
C. G. Stoddard .....	Dayton Motor Car Co.	Dayton, O.
Chas. E. Duryea .....	Chas. E. Duryea.....	Reading, Pa.
B. A. Becker .....	Elmore Mfg. Co.	Clyde, O.
B. F. Everitt .....	Everitt-Metzger-Flanders Co.	Detroit, Mich.
James Couzins .....	Ford Motor Co.	Detroit, Mich.
Giles H. Stillwell .....	H. H. Franklin Mfg. Co.	Syracuse, N. Y.
A. L. Garford .....	The Garford Co.	Elyria, O.
C. H. Haynes .....	Haynes Automobile Co.	Kokomo, Ind.
Edward R. Hewitt .....	Hewitt Motor Co.	10 E. 31st St., New York.
R. D. Chapin .....	Hudson Motor Car Co.	Detroit, Mich.
Charles Jeffery .....	Thomas B. Jeffery & Co.	Kenosha, Wis.
W. E. Wright .....	Knox Automobile Co.	Springfield, Mass.
S. T. Davis, Jr .....	Locomobile Co. of America	Bridgeport, Conn.
H. A. Lozler, Jr .....	Lozier Motor Co.	Broadway & 56th St., New York.
C. W. Matheson .....	Matheson Motor Car Co.	Wilkes Barre, Pa.
Benjamin Briscoe .....	Maxwell-Briscoe Motor Co.	Tarrytown, N. Y.
Wm. E. Metzger .....	Metzger Motor Car Co.	Detroit, Mich.
J. W. Gilson .....	Mitchell-Lewis Motor Co.	Racine, Wis.
W. H. Van Der Voort.....	Moline Automobile Co.	E. Moline, Ill.
S. H. Mora .....	Mora Motor Co.	Newark, N. Y.
George M. Dickson .....	Nat'l Motor Vehicle Co.	Indianapolis, Ind.
W. C. Marmon.....	Nordyke & Marmon Co.	Indianapolis, Ind.
Angus Smith .....	Olds Motor Works.	Lansing, Mich.
S. D. Waldon .....	Packard Motor Car Co.	Detroit, Mich.
L. H. Kittredge .....	Peerless Motor Car Co.	Cleveland, O.
Charles Clifton .....	Pierce Arrow Motor Car Co.	Buffalo, N. Y.
Albert L. Pope .....	Pope Mfg. Co.	Hartford, Conn.
H. O. Smith .....	Premier Motor Mfg. Co.	Indianapolis, Ind.

M. Grabowsky .....	Rapid Motor Vehicle Co.....	Pontiac, Mich.
R. E. Olds .....	Reo Motor Car Co.....	Lansing, Mich.
R. H. Salmous .....	Selden Motor Vehicle Co.....	Rochester, N. Y.
F. B. Stearns .....	F. B. Stearns Co.....	Cleveland, O.
C. C. Hildebrand .....	Stevens-Duryea Co.....	Chicopee Falls, Mass.
William R. Innis .....	Studebaker Bros. Mfg. Co.....	Broadway & 48th St., N. Y.
E. L. Thomas .....	E. R. Thomas Motor Co.....	Buffalo, N. Y.
Walter C. White .....	Waltham Mfg. Co.....	Cleveland, O.
Wm. C. Johnson .....	Waverley Co. ....	Indianapolis, Ind.
Windsor T. White .....	White Company.....	Cleveland, O.
J. N. Willys .....	Willys-Overland Motor Co. ....	Toledo, Ohio.
Thomas Henderson .....	Winton Motor Carriage Co....	Cleveland, O.
L. E. Burr .....	Woods Motor Vehicle Co.....	2515 Calumet Ave., Chicago, Ill.

### ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS

Headquarters, 7 East 42nd St., New York, N. Y., Alfred Reeves, General Manager.

Object: The protection of the rights of members of the Association under the Selden patent and several hundred other patents in the control of its members. Each member conducts its business independently and the only bond between them is their mutual recognition of the Selden patent and the conviction that such recognition is a guarantee that purchasers of their machines will be immune from liability of lawsuits arising from alleged infringements of the patent in question.

#### OFFICERS

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Vice-President .....	S. T. Davis, Jr.
Secretary .....	L. H. Kittredge
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S. T. Davis, Jr.	Hugh Chalmers
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#### HAND BOOK COMMITTEE

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George Pope, Chairman

M. L. Downs, Secy.

Charles Clifton

#### MEMBERS.

Licensees Under Selden Patent at this Date, March 14, 1910, and the Cars They Make.

Acme Motor Car Co., Reading, Pa. Acme.	Jackson Automobile Co., Jackson, Mich.
American Locomotive Company, New York.	Jackson.
Alco.	Knox Automobile Co., Springfield, Mass.
American Motor Car Co., Indianapolis, Ind.	Knox.
American.	Locomobile Co. of America, Bridgeport, Conn.
Apperson Bros. Auto Co., Kokomo, Ind. Ap-	Locomobile.
person.	Lozier Motor Co., New York. Lozier.
Atlas Motor Car Co., Springfield, Mass. Atlas.	W. H. McIntyre Co., Auburn, Ind. McIntyre.
Autocar Co., Ardmore, Pa. Autocar.	Mack Bros. Motor Car Co., Allentown, Pa.
Bartholomew Co., Peoria, Ill. Glide.	Mack Commercial Cars.
Brush Runabout Co., Detroit, Mich. Brush.	Marquette Motor Co., Saginaw, Mich. Rainier.
Buckeye Mfg. Co., Anderson, Ind. Lambert.	Matheson Motor Car Co., Wilkes-Barre, Pa.
Buick Motor Co., Flint, Mich. Buick.	Matheson.
Cadillac Motor Car Co., Detroit, Mich. Cad-	Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
illac.	Maxwell.
Cartercar Co., Pontiac, Mich. Cartercar.	Mercer Automobile Co., Trenton, N. J. Mer-
Chalmers Motor Co., Detroit, Mich. Chalmers.	cer.
Columbia Motor Car Co., Hartford, Conn.	Metzger Motor Car Co., Detroit, Mich. Ever-
Columbia.	itt, Hewitt Truck.
Corbin Motor Vehicle Corp., New Britain,	Mitchell-Lewis Motor Co., Racine, Wis.
Conn. Corbin.	Mitchell.
Courier Car Co., Dayton, O. Courier.	Moline Automobile Co., East Moline, Ill.
Dayton Motor Car Co., Dayton, O. Stoddard-	Moline.
Dayton.	Moon Motor Car Co., St. Louis, Mo. Moon.
Dorris Motor Car Co., St. Louis, Mo. Dorris.	Mora Company, Newark, N. Y. Mora.
Elmore Mfg. Co., Clyde, O. Elmore.	National Motor Vehicle Co., Indianapolis, Ind.
E-M-F Co., Detroit, Mich. E-M-F, Flanders.	National.
Ewing Automobile Co., Geneva, O. Ewing	Nordyke and Marmon Co., Indianapolis, Ind.
Taxicab.	Marmon.
Fuller Buggy Co., Jackson, Mich. Fuller.	Oakland Motor Car Co., Pontiac, Mich. Oak-
Grabowsky Power Wagon Co., Detroit, Mich.	land.
Grabowsky Commercial Cars.	Ohio Motor Car Co., Carthage, O. Ohio.
H. H. Franklin Mfg. Co., Syracuse, N. Y.	Olds Motor Works, Lansing, Mich. Oldsmo-
Franklin.	bile.
Haynes Automobile Co., Kokomo, Ind. Haynes.	Packard Motor Car Co., Detroit, Mich. Pack-
Hudson Motor Car Co., Detroit, Mich. Hudson.	ard.
Hupp Motor Car Co., Detroit, Mich. Hupmo-	Palmer & Singer Mfg. Co., New York. Pal-
bile.	mer-Singer.

Peerless Motor Car Co., Cleveland, O. Peerless.  
Pierce-Arrow Motor Car Co., Buffalo, N. Y. Pierce-Arrow.  
Pierce Motor Co., Racine, Wis. Pierce-Racine.  
Pope Mfg. Co., Hartford, Conn. Pope-Hartford..  
Premier Motor Manufacturing Co., Indianapolis, Ind. Premier.  
Pullman Motor Car Co., York, Pa. Pullman.  
Randolph Motor Car Co., Chicago, Ill. Randolph Truck.  
Rapid Motor Vehicle Co., Pontiac, Mich. Rapid Commercial Cars.  
Regal Motor Car Co., Detroit, Mich. Regal.  
Reliance Motor Truck Co., Owosso, Mich. Reliance Truck.  
Reo Motor Car Co., Lansing, Mich. Reo.  
Royal Tourist Car Co., Cleveland, O. Royal Tourist.  
Alden Sampson Manufacturing Co., Pittsfield, Mass. Sampson Truck.

Selden Motor Vehicle Co., Rochester, N. Y. Selden.  
Simplex Automobile Co., New York. Simplex.  
Simplex Motor Car Co., Mishawaka, Ind. Simplex.  
Smith Automobile Co., Topeka, Kans. Great Smith.  
Speedwell Motor Car Co., Dayton, O. Speedwell.  
F. B. Stearns Co., Cleveland, O. Stearns.  
Stevens-Duryea Co., Chicopee Falls, Mass. Stevens-Duryea.  
Studebaker Automobile Co., South Bend, Ind. Studebaker-Garford.  
E. R. Thomas Motor Co., Buffalo, N. Y. Thomas.  
Waltham Mfg. Co., Cleveland, O. White.  
Willys-Overland Co., Toledo, O. Overland, Marion.  
Winton Motor Carriage Co., Cleveland, O. Winton.

Importers and the cars they are licensed to import and sell:

Brewster & Co., Broadway and 47th St., New York City. Flandrau Motor Car Co., 406 Broome St., New York City. Delaunay-Belleville, New York City. Brasier, Hol-Tan Company, 1741 Broadway, New York City. Lancia.

COMMERCIAL MOTOR VEHICLE MANUFACTURERS' ASSOCIATION

Headquarters, Metropolitan Block, Chicago, Ill.

## OFFICERS

Chairman .....	G. M. Weeks
Treasurer .....	H. F. Hamilton
Vice-Chairman .....	Oscar Lear
Secretary .....	J. E. Burke
General Manager .....	Walter Wardrop

## BOARD OF MANAGERS

H. G. Hamilton	Rapid Motor Vehicle Co.
Oscar Lear	Oscar Lear Automobile Co.
J. E. Burke	Lambert Motor Truck Co.
G. M. Weeks	Weeks Commercial Vehicle Co.
H. C. Eddy	American Motor Truck Co.
G. V. Rogers	Mitchell Motor Car Co.
Hayden Eames	Studebaker Automobile Co.

## MOTOR AND ACCESSORY MANUFACTURERS

Headquarters, Argus Bldg., 17 W. 42nd St., New York City

To be eligible to membership in this association, a concern must be engaged in the manufacture of articles used in the automobile industry. Initiation fee is \$100 and annual dues, \$50.

## OFFICERS

President	H. E. Raymond
First Vice-President	H. T. Dunn
Second Vice-President	F. E. Castle
Third Vice-President	C. E. Whitney
Treasurer	W. S. Gorton
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Auto Improvement Co., New York City.  
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 Brown Lippe Gear Co., Syracuse, N. Y.  
 Bryant Steel Wheel & Rim Co., Columbus, O.  
 Byrne-Kingston & Co., Kokomo, Ind.  
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 C. Cowles & Co., New Haven, Conn.  
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 Diamond Chain Mfg. Co., Indianapolis, Ind.  
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 R. E. Dietz Co., New York City.  
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 Firestone Tire & Rubber Co., Akron, Ohio.  
 Fisk Rubber Co., Chicopee Falls, Mass.  
 Fox Metallic Tire Belt Co., Brooklyn, N. Y.  
 G & J Tire Co., Indianapolis, Ind.  
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 Gemmer Mfg. Co., Detroit, Mich.  
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 Goodyear Tire & Rubber Co., Akron, O.  
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 Hayes Mfg. Co., Detroit, Mich.  
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 Hodgman Rubber Co., New York, N. Y.  
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 Hydraulic Pressed Steel Co., Cleveland, O.  
 Imperial Brass Mfg. Co., Chicago, Ill.  
 Janney-Steinmetz & Co., Philadelphia, Pa.  
 Phineas Jones & Co., Newark, N. J.  
 Jones Speedometer Co., New York City.  
 Kokomo Electric Co., Kokomo, Ind.  
 Leather Tire Goods Co., Niagara Falls, N. Y.  
 Lebanon Steel Casting Co., Lebanon, Pa.  
 W. H. Leland & Co., Worcester, Mass.  
 Lavigne Mfg. Co., Detroit, Mich.  
 Light Mfg. & Fdy. Co., Pottstown, Pa.  
 Link-Belt Co., Indianapolis, Ind.  
 Livingston Radiator & Mfg. Co., N. Y. City.  
 Long Mfg. Co., Chicago, Ill.  
 Lovell-McConnell Mfg. Co., Newark, N. J.  
 Lunkenheimer Co., Cincinnati, Ohio.  
 McCord Mfg. Co., Detroit, Mich.  
 Manhattan Screw & Stamping Works, N. Y. City.  
 Mfgs. Foundry Company, Waterbury, Conn.  
 C. A. Metzger, New York City.  
 Michelin Tire Co., Milltown, N. J.  
 Morgan & Wright, Detroit, Mich.  
 A. R. Mosler & Co., N. Y. City.  
 Motsinger Device Mfg. Co., Pendleton, Ind.  
 Motz Clincher Tire & Rubber Co., Akron, O.  
 Muncie Gear Works, Muncie, Ind.  
 National Carbon Co., Cleveland, O.  
 National Coil Co., Lansing, Mich.  
 National Tube Co., Pittsburg, Pa.  
 Never-Miss Spark Plug Co., Lansing, Mich.  
 New Departure Mfg. Co., Bristol, Conn.  
 New Process Rawhide Co., Syracuse, N. Y.  
 N. Y. Edison Co., New York City.  
 N. Y. & N. J. Lubricant Co., N. Y. City.  
 Noera Mfg. Co., Waterbury, Conn.  
 Oliver Mfg. Co., Chicago, Ill.  
 Pantasote Co., N. Y. City.  
 Parish & Bingham Co., Cleveland, O.  
 Parish Mfg. Co., Reading, Pa.  
 Pennsylvania Rubber Co., Jeannette, Pa.  
 Pittsfield Spark Coil Co., Dalton, Mass.  
 Prest-O-Lite Co., Indianapolis, Ind.  
 Randall-Faichney Co., Boston, Mass.  
 Rands Mfg. Co., Detroit, Mich.  
 Reading Metal Body Co., Fleetwood, Pa.  
 Reeves Pulley Co., Columbus, Ind.  
 Remy Electric Co., Anderson, Ind.  
 Republic Rubber Co., Youngstown, O.  
 Wm. C. Robinson & Son Co., Baltimore, Md.  
 Rose Mfg. Co., Philadelphia, Pa.  
 Ross Gear & Tool Co., Lafayette, Ind.  
 Royal Equipment Co., Bridgeport, Conn.  
 J. H. Sager Co., Rochester, N. Y.  
 Salisbury Wheel Mfg. Co., Jamestown, N. Y.  
 Schwarz Wheel Co., Philadelphia, Pa.  
 Seamless Rubber Co., New Haven, Conn.  
 Seamless Tube Co. of America, Pittsburg, Pa.  
 C. A. Shaler Co., Waupun, Wis.  
 A. O. Smith Co., Milwaukee, Wis.  
 Alden Speare's Sons Co., Boston, Mass.  
 Spicer Mfg. Co., Plainfield, N. J.  
 C. F. Splitdorf Co., N. Y. City.  
 Sprague Umbrella Co., Norwalk, Ohio.  
 Springfield Metal Body Co., Springfield, Mass.  
 Stackpole Battery Co., St. Marys, Pa.  
 Standard Connecting Rod Co., Beaver Falls, Pa.  
 Standard Roller Bearing Co., Philadelphia, Pa.  
 Standard Welding Co., Cleveland, O.  
 Stewart & Clark Mfg. Co., Chicago, Ill.  
 Strieby & Foote Co., Newark, N. J.  
 Stromberg Motor Devices Co., Chicago, Ill.  
 Swinehart Tire & Rubber Co., Akron, O.  
 Syracuse Aluminum & Bronze Co., Syracuse, N. Y.  
 Thermoid Rubber Co., Trenton, N. J.  
 Timken Detroit Axle Co., Detroit, Mich.  
 Timken Roller Bearing Co., Canton, O.  
 Turner Brass Works, Sycamore, Ill.  
 U. S. Light & Heating Co., New York City.  
 Vacuum Oil Co., New York City.  
 Valentine & Co., N. Y. City.  
 Veeder Mfg. Co., Hartford, Conn.  
 Vesta Accumulator Co., Chicago, Ill.  
 Warner Gear Co., Muncie, Ind.  
 Warner Instrument Co., Beloit, Wis.  
 Warner Mfg. Co., Toledo, O.  
 Weed Chain Tire Grip Co., N. Y. City.  
 Westchester Appliance Co., New York City.  
 Weston-Mott Co., Flint, Mich.  
 Wheeler & Schebler, Indianapolis, Ind.  
 Whitely Steel Co., Muncie, Ind.  
 Whitlock Coil Pipe Co., Hartford, Conn.  
 Whitney Mfg. Co., Hartford, Conn.  
 J. H. Williams Co., Brooklyn, N. Y.  
 Witherbee Igniter Co., Springfield, Mass.



# SOCIETY OF AUTOMOBILE ENGINEERS

Headquarters, 2 Rector St., Room 1318, New York City.

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President ..... Henry Hess  
 First Vice-President ..... Russell Huff  
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## MANAGERS

David Ferguson  
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# AUTOMOBILE TRADE CREDIT ASSOCIATION

Headquarters, No. 80 Wall Street, New York City

Annual meeting, second Wednesday in January.

Board of Directors' Meeting Held Monthly.

Objects: To aid members in collections; protect against irresponsible debtors; collect and disseminate information.

This is a protective Organization of the motor industry, which is not an enterprise for private gain—being a purely membership organization.

Requirements of Membership: "Any manufacturer or wholesale dealer in automobiles, motor boats and their accessories, and those engaged in other lines of business allied therewith, shall be eligible to membership."

## OFFICERS

Acting President, Carl Kaufman, The Motor Car Equipment Co., New York City.  
 Treasurer, M. J. Martin, G. A. Haws Co., New York City.  
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 J. J. Cohn, Nonpareil Horn Mfg. Co., Brooklyn, N. Y.

# THE AMERICAN AUTOMOBILE ASSOCIATION

Headquarters, 437 Fifth Avenue, New York City

A national body of motor users, now in its eighth year and composed of thirty-four state associations comprising two hundred and forty-five automobile clubs, a score of unfederated clubs with a total of over twenty-five thousand members.

Main Objects: Uniting in one body of all the automobile clubs and individual motorists of the country; and the promotion and furtherance of favorable legislation, reasonable enforcement of motor laws and ordinances, sportsmanlike contests and reliable records, as well as all movements—local, state and federal—toward the construction and maintenance of good roads. Any automobile owner or automobile club is eligible to membership.

## OFFICERS

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 Second Vice-President—Frank M. Joyce, Minneapolis Automobile Club.  
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 Treasurer—H. A. Bonnell, New Jersey Automobile & Motor Club.  
 Secretary—Frederick H. Elliott, 437 Fifth Avenue, New York.

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Including also Chairmen of Boards

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S. M. Butler, Contest Board      Powell Evans, Touring Information Board

### NATIONAL ASSOCIATION OF ENGINE AND BOAT MANUFACTURERS

Headquarters, Engineering Bldg., 29 West 39th Street, New York City

Object: To protect, promote, further and advance the interests of the members, as manufacturers and sellers of engines, motors and boats of every kind and description and accessories thereto, and as journalists devoted in all or in part to the interests of engines, motors and boats and allied and kindred industries.

### OFFICERS

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First Vice-President ..... Henry R. Sutphen  
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Third Vice-President ..... J. M. Truscott  
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#### TECHNICAL COMMITTEE

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# **FEDERATION OF AMERICAN MOTORCYCLISTS**

Office of the President, Box 133, Indianapolis, Ind.

## **OFFICERS**

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 Secretary ..... Chas. F. Ball, 423 Saks Bldg., Indianapolis, Ind.  
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 E. M. Hughes for Southern District, 2003 Main St., Louisville, Ky.  
 Chas. Wyatt for Western District, 444 W. Vermont St., Indianapolis, Ind.  
 C. M. Frink for Pacific District, 645 S. Spring St., Los Angeles, Cal.

# **IMPORTERS' AUTOMOBILE SALON**

Headquarters, Bryant Park Bldg., Sixth Avenue and 42nd Street, New York City

## **OFFICERS**

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 Vice-President ..... Paul La Croix  
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 General Manager ..... Walter R. Lee

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Fiat Automobile Co.	Panhard & Levassor
S. B. Bowman Automobile Co.	Delahaye Import Co.
De Dietrich Import Co.	Isotta Import Co.
	Palais de l'Automobile
Renault Freres Sell. Branch	

# **AUTOMOBILE AND MOTOR TRADES' ASSOCIATION**

Office of the Secretary, 230 William St., Rochester, N. Y.

The Automobile & Motor Trades' Association was formed for the purpose of conducting automobile shows and automobile sports of all kinds and for the protection and benefit of the trade in general.

## **OFFICERS**

President ..... Robert Searls  
 Vice-President ..... William P. Graham  
 Secretary ..... Frank W. Peck  
 Treasurer ..... William S. Roby

# **NATIONAL GAS AND GASOLINE ENGINE TRADES ASSOCIATION**

Albert Stritmatter, Secy., Cincinnati, Ohio.

Object: "To promote, further and advance the interests of the trade, also to hold a national convention once a year of the interested parties, the purpose of such convention to be for the promoting of education and sociability among the members of the Association."

Membership is open to anyone who is interested in gas and gasoline engines of any type, and allied accessories. Annual dues are \$5.

The next meeting will be held at Cincinnati, O., June 13, 14, 15 and 16, 1910. Papers will be read by leading authorities on subjects covering the entire field from farm engines to air-ship motors. There will be a very complete exhibition of engines and accessories, space for exhibits and admission to same being free. A series of social entertainments will be provided and especial care will be taken of the ladies who are invited to attend.

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First Vice-President .....	C. O. Hamilton, Elyria, O.
Treasurer .....	Otto M. Knoblock, South Bend, Ind.
Secretary .....	Albert Stritmatter, Cincinnati, O.

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Otto M. Knoblock	M. A. Loeb
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O. C. Parker	H. W. Bolens
H. W. Jones	

## MOTORCYCLE MANUFACTURERS' ASSOCIATION

Wm. F. Remppis, Water Street, Reading, Pa.

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## INTERNAL COMBUSTION ENGINEERS' ASSOCIATION

Office of Secretary, 416 W. Indiana St., Chicago, Ill.

Object: To advance in the broadest sense, and in every legitimate manner, the interests of internal combustion engineers.

### OFFICERS

President .....	Homer R. Linn
Vice-President .....	H. E. King
Treasurer .....	I. J. Babcock
Secretary .....	Chas. Kratsch, 416 W. Indiana St., Chicago.

The Internal Combustion Engineers' Association was formed in Chicago November 6, 1908. Its aim is to collect data from operating engineers that will tend toward standardization of parts and improvement in design and construction of internal combustion engines and to help both owners and operators to secure more reliable and efficient service from their equipment.

An active member must be an operating engineer of an internal combustion engine, a superintendent or chief engineer, an erecting engineer, a designing engineer, or a consulting engineer.

An associate member may be any one who is sufficiently interested in internal combustion engines to make application for such membership and pay the required fees and dues.

Dues, \$1 per year; initiation fee of \$1 for both active and associate members.

## MANUFACTURERS' CONTEST ASSOCIATION

Headquarters, 1780-82 Broadway, New York City, Seventh Floor.

Objects—The voluntary advancing of healthy, sportsmanlike, and uniform conditions in automobile contests of every nature, and causing such contests to be held under the auspices of an active organization, supported and governed by representative interests in automobile affairs.

### OFFICERS

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Benjamin Briscoe, Maxwell-Briscoe Motor Co.	Wm. E. Metzger, Metzger Motor Car Co. H. E. Coffin, Hudson Motor Car Co.
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C. G. Stoddard, Dayton Motor Car Co. James Heaslet, E-M-F Co. E. Rand Hollander, Fiat Automobile Co. C. H. Tangeman, Hol-Tan Company. Howard Marmon, Nurdyke & Marmon Co. F. R. Bump, H. H. Franklin Mfg. Co. F. B. Holmes, Jackson Automobile Co.	

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A. L. Riker	A. P. Brush
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## II. Local Associations

### NEW ENGLAND ENGINE AND BOAT ASSOCIATION

Headquarters, 5 Park Square, Boston, Mass.

Annual Meeting, First Tuesday in June.

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Vice-President .....	J. S. Poyen
Treasurer .....	C. J. Jaeger
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### THE CLEVELAND AUTOMOBILE DEALERS' COMPANY

Headquarters, Cleveland Automobile Club Rooms, Hollenden Hotel

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C. M. Brockway, Vice-President.....	Winton Motor Car Co.
H. M. Adams, Secretary .....	The White Co., Ohio Sales Dept.
C. M. Brockway, Treasurer.....	Winton Motor Car Co.

**LOUISVILLE AUTOMOBILE DEALERS' ASSOCIATION**

Louisville, Kentucky

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Vice-President .....	A. G. Reimers
Secretary and Treasurer .....	Hubert Levy

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**DETROIT AUTOMOBILE DEALERS' ASSOCIATION**

Headquarters, 245 Jefferson Avenue, Detroit, Mich.

**OFFICERS**

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Vice-President .....	J. P. Schneider
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**CHICAGO AUTOMOBILE TRADE ASSOCIATION**

Chicago, Ill.

Object: To afford mutual protection to its members and to the public, and to develop, as far as may be, the automobile business on right and proper lines.

**OFFICERS**

President .....	Louis Geyler, Stevens-Duryea Company.
Vice-President .....	John H. Kelly, Republic Rubber Company.
Secretary .....	F. E. Sparks, United Manufacturers.
Treasurer .....	Henry Paulman, Pierce Arrow Motor Car Co.

**DIRECTORS**

Louis Geyler	James E. Plew
F. E. Sparks	John Kelly
Henry Paulman	Thos. J. Hay
	Geo. H. Bird

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Buick Motor Co.	Kissel Motor Co.
Cadillac Motor Co.	Knox Automobile Co.
Centaur Motor Co.	Levy-Hipple Co.
Cornish-Friedberg Motor Co.	Locomobile Co. of America
Cleveland Automobile Co.	Maxwell-Briscoe Co.
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Chicago Vulcanizing Co.	Morgan & Wright
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Ford Motor Co.	Republic Rubber Co.
Franco-Am. Auto & Supply Co.	Studebaker Bros. Mfg. Co.
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Githens Brothers Co.	W. W. Shaw & Co.
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**NEW YORK AUTOMOBILE TRADE ASSOCIATION**

Headquarters, 47 W. 42nd Street, New York City

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 C. W. Wurster ..... Wyckoff, Church & Partridge.  
 C. P. Skinner ..... Mitchell Motor Company.  
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 G. W. Bennett ..... The White Company.  
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 Wm. Haradon ..... Victor Auto Storage Co.  
 Peter Fogarty ..... Elmore Motor Car Co.  
 C. Andrade, Jr. .... Counsel.  
 W. W. Burk ..... Carl H. Page Co.  
 A. J. Inderreiden ..... Warner Instrument Co.

**AUTOMOBILE TRADE ASSOCIATION OF PHILADELPHIA**

Headquarters, S. W. Corner Broad &amp; Callowhill Sts., Philadelphia.

Object: To afford mutual protection to its members and to the public, and to advance and develop so far as may be the automobile business in the City of Philadelphia and vicinity.

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**COMMITTEE ON ADMISSIONS**

F. G. Browning      F. C. Van Derhoof

Requirements of Membership: The membership consists of two classes, Active and Associate. Any person, co-partnership or corporation of good standing and engaged as principal in the manufacture or sale of automobiles in and about Philadelphia, shall be eligible to Active Membership.

Any person, co-partnership or corporation of good standing engaged in and about Philadelphia in the manufacture or sale of automobile parts or accessories, or as sub-agent in the manufacture or sale of automobiles, shall be eligible to Associate Membership.

**BOSTON AUTOMOBILE DEALERS' ASSOCIATION, INC.**

Headquarters, 5 Park Square, Boston, Mass.

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 C. E. Fay      A. P. Underhill  
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 F. E. Wing



**AUTOMOBILE DEALERS' ASSOCIATION OF PITTSBURG, INC.**

Headquarters, 5923 Baum Street, E. E. Pittsburg, Pa.

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G. P. Moore, Treasurer .....	Keystone Automobile Co. (Mgr.)

**NEW JERSEY AUTOMOBILE TRADE ASSOCIATION**

Headquarters, 124 Washington St., Newark, N. J.

The New Jersey Automobile Trade Association aims to further the interests of all dealers in the State of New Jersey.

**OFFICERS**

President .....	George Paddock (Paddock Zusi Automobile Co.)
Vice-President .....	J. W. Mason
Treasurer .....	R. A. Greene (Greene Motor Car Co.)
Secretary .....	W. H. Ellis (Ellis Motor Car Co.)

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L. V. Zusi (Paddock-Zusi Automobile Co.) .....	Newark
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I. M. Upperco (Detroit-Cadillac Motor Car Co.) .....	Newark
C. R. Zacharias (Asbury Park Garage) .....	Asbury Park
George Smith (Peerless Motor Car Co.) .....	Asbury Park

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San Francisco, Cal.

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Vice-President .....	A. E. Hunter
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Secretary .....	H. Choynski

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# COMMERCIAL POST CARDS

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**CHILTON COMPANY,**MARKET & FORTY-NINTH STS.  
PHILADELPHIA

## SECTION VI

## Useful Information and Recipes

## TO CLEAN BRASS

An economical method of cleaning brass is to rub it with a mixture of vinegar and salt, or oxalic acid, then wash with water and polish with Tripoli and sweet oil, or with any good brass polish.

## BRASS CLEANING PASTE

The following makes a good cleaning paste: Rotten stone 6 ozs. oxalic acid 1 oz., equal parts of whale oil and spirits of turpentine sufficient to make a paste.

A general metal polishing paste may be made as follows: The quantity of the parts being by weight: Petroleum jelly (white) 90 parts, kieselguhr 30 parts, refined paraffine wax 10 parts, refined chalk, or whiting 10 parts, sodium hypophosphite 8 parts. The jelly and the wax are first melted and the other ingredients stirred in and the entire mass ground. A little citronelle can be added to cover up disagreeable odors and scent the paste.

A polishing powder may be made as follows; the quantities being by weight: Putty powder 14 parts, pipe clay 14 parts, kieselguhr 42 parts, tartaric acid (powdered) 1½ parts.

## LIQUID POLISHES

Kieselguhr 7 pounds, bath brick (powdered) 3 pounds, oil of lemon 2 oz., lemon juice 1 gallon, paraffine oil 1 gallon, malt vinegar 4 gallons.

Another liquid polish for metals is as follows: Jewelers' red 25 parts, oil of turpentine 15 parts, oil of stearine 25 parts, animal charcoal 45 parts, alcohol sufficient to make the mass practically liquid. Apply with a stiff brush. After the alcohol has evaporated rub the surface with a dry cloth.

Another formula consists of the following: 16 pounds crude oleic acid, 5 pounds kieselguhr, 4 pounds tasteless mineral oil, 1½ oz. lemon oil. Mix the powders into a paste and gradually thin with the mixed fluids, being careful to prevent formation of lumps. Apply with a rag or waste, and when practically dry rub with another rag or waste.

## TO REMOVE RUST

Rust may be removed from iron by immersing the piece for several days, or until the rust has entirely disappeared, in water to which a little sulphuric acid has been added with a piece of zinc firmly attached to the iron so that it makes a good contact. The iron is not attacked as long as the zinc remains in contact with it.

Iron or steel may be cleaned of rust by the use of the following: 100 parts stannic chloride dissolved in 1000 parts water. Add to a solution containing 2 parts tartaric acid dissolved in 1000 parts water. Add to the mixture 20 cubic centimetres indigo solution diluted with 2000 parts of water. Clean the metal parts of all grease, apply the solution to the stained portions for a few seconds, rub clean with a moist cloth, then with a dry cloth, and if desired then use any good metal polish. Old rust may be removed in some cases by rubbing with a paste consisting of equal parts of fine Tripoli and flowers of sulphur thoroughly mixed with olive oil.

Powdered alum in strong vinegar, oil of tartar, or fine emery are also used to remove rust. Kerosene, or turpentine if left on the stained or rusted portions over night will sufficiently soften the rust so that it may be removed by the use of fine emery cloth followed by a polishing powder.

Rust spots on nickel can be treated with grease, and after several days rubbed with a rag saturated with a few drops of hydrochloric acid in ammonia. Parts should be thoroughly rinsed, dried and polished.

## RUST PREVENTIVE

The following is a good rust preventive for steel: 16 parts turpentine, and 1 part cautchouc dissolved by a gentle heat. To this add 8 parts boiled oil, stir and at the same time bring to the boiling point. Apply with a brush after the manner of varnishing. This coating can be removed by the use of turpentine if desired.

## ALUMINUM POLISH

An emulsion of equal parts of rum and olive oil can be used for cleaning aluminum. Potash lye not too strong is also effective in brightening aluminum, benzol is also used.

A good polish for aluminum consists of a paste formed of emery and tallow, the finish lustre being obtained by the use of rouge powder with oil of turpentine.

## BRASS LACQUER

A good brass lacquer consists of the following: 2 pints alcohol, 2 oz. turmeric, 6 oz. seed lac (coarse powdered), ½ oz. saffron, ½ oz. annatto. The annatto, saffron and turmeric are allowed to dissolve in the alcohol for several days, then strained into a bottle containing the seed lac. Cork and shake the mixture until dissolved.

## ALUMINUM LACQUER

For aluminum dissolve 100 parts gum lac in 300 parts ammonia, heating for 1 hour over a water bath, paint the thoroughly cleaned aluminum with the varnish and heat it to about 570 degrees Fahrenheit.

## POLISH FOR VARNISHED WOOD

Shake well together 1 pint vinegar, 1 oz. alcohol, 1 pint oil (linseed) 1 oz. butter of antimony.

A polish for burnished wood surfaces may be made of the following: Wood pulp 40 parts, hydrochloric acid 44 parts, chloride of lime  $15\frac{1}{2}$  parts, turpentine  $\frac{1}{2}$  part. Mix in the form of a paste and smear over the surface, allowing it to remain a short time and remove it by quick strokes of a soft brush, or leather, thoroughly cleaning the surface. Rub gently to a polish with a fresh piece of cloth or chamois. This preparation will not affect the varnish. It can also be used on brass and other metals without corrosion.

For very highly polished surfaces the following may be used: Dissolve 5 parts potassium carbonate in 300 parts water, dissolve in this 500 parts shaved up bees wax by boiling until the wax is partially saponified, replacing the water evaporated. Remove from the fire and stir until cold, add oil of turpentine 800 parts, stir constantly until a smooth emulsion results, then add 800 parts of distilled water, continuing the stirring. Wash, rinse and dry the surface to be polished. Apply the paste as uniformly and as thinly as possible, rub off with a soft woolen cloth.

## TO REMOVE OIL STAINS FROM LEATHER

Cover the spot with spirits of sal-ammoniac, allow it to act for a short time, cleaning with clear water, repeat until the spot is removed, taking care not to affect the color of the leather.

## LEATHER PRESERVATIVES

100 parts sweet oil, 100 parts mutton suet, 2 parts turpentine. Melt together and apply to the leather, which has been sufficiently warmed so that it will liquefy and absorb the fat. Another formula is as follows: 10 oz. linseed oil, 10 oz. mutton fat, 1 oz. Venice turpentine melted together. Apply to the leather when dry and warm and it will preserve it against wet or snow.

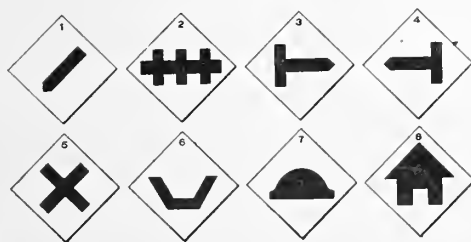
## LEATHER DRESSING

An effective leather dressing suitable for tops can be made as follows: To 2 parts of common glue liquefied by heating, add 3 parts castile soap, dissolve by heating together with 120 parts water, stirring until a good mixture is obtained. Add 4 parts spirit varnish, and then mix 2 parts wheat starch with water and throw in. For black leather sufficient lampblack can be added without killing the gloss of the dressing.

Shabby leather can be much improved by either linseed oil, or the well beaten whites of eggs mixed with suitable coloring matter. The surface can be brought to a gloss by the use of a soft duster.

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## Road Signs



American Motor League "Caution Signs." Background and posts white, symbols black.

No. 1 indicates approach to a steep descent; No. 2, approach to a railroad crossing; No. 3, approach to a branch road (to right); No. 4, approach to a branch road (to left); No. 5, approach to cross roads; No. 6, approach to a ditch or abrupt depression in the road; No. 7, approach to a hummock or "thank you, ma'am;" No. 8, approach to a city, village or other collection of inhabited dwellings; No. 9, is a general caution signal indicating the proximity of any danger or obstruction not scheduled above, or any other condition requiring caution. No. 9, (not shown in cut) is a plain white sign and can be improvised in emergent cases by using a sheet of white cloth fastened upon a board of proper shape. Each sign is placed at a distance of not less than 200, nor more than 300 yards from the point to which it refers.

**PILOT RULES FOR THE INLAND WATERS OF THE ATLANTIC AND PACIFIC  
COASTS AND ON THE GULF OF MEXICO, EXCEPT RIVERS EMPTYING  
INTO THE GULF OF MEXICO AND THEIR TRIBUTARIES.**

Rules and regulations for the government of pilots of vessels propelled by steam, gas, fluid, naphtha or electric motors, and of other vessels propelled by machinery, navigating the harbors, rivers, and inland waters of the United States, except the Great Lakes and their connecting and tributary waters as far east as Montreal, the Red River of the North, and rivers emptying into the Gulf of Mexico and their tributaries as amended by the Board of United States Supervising Inspectors, Steamboat Inspection Service, on February 19, 1909, and approved by the Secretary of Commerce and Labor on March 20, 1909, under the authority of an act of Congress approved June 7, 1897, and the act of Congress approved February 14, 1903, establishing the Department of Commerce and Labor.

These rules shall be effective on and after March 20, 1909.

**Preliminary.**

In the following rules the words steam vessel and steamer shall include any vessel propelled by machinery.

A vessel is under way, within the meaning of these rules, when she is not at anchor, or made fast to the shore, or aground.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

**Signals.**

The whistle signals provided in these rules shall be sounded on an efficient whistle or siren sounded by steam or by some substitute for steam.

A short blast of the whistle shall mean a blast of about one second's duration.

A prolonged blast of the whistle shall mean a blast of from four to six seconds' duration.

One short blast of the whistle signifies intention of or assent to steamer first giving the signal to direct course to own starboard, except when two steamers are approaching each other at right angles or obliquely, when it signifies intention of steamer which is to starboard of the other to hold course and speed.

Two short blasts of the whistle signify intention of or assent to steamer first giving the signal to direct course to own port, except when two steamers are approaching each other at right angles or obliquely, when the signal signifies desire of or assent to steamer which is to port of the other to cross the bow of steamer to starboard.

Three short blasts of the whistle shall mean, "My engines are going at full speed astern."

When vessels are in sight of one another a steam vessel under way whose engines are going at full speed astern shall indicate that fact by three short blasts on the whistle.

Rule I. If, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam whistle, the danger signal.

Whenever the danger signal is given the engines of both steamers shall be stopped and backed until the headway of the steamers has been fully checked; nor shall the engines of either steamer be again started ahead until the steamers can safely pass each other, and the proper signals for passing have been given, answered, and understood.

Rule II. Steam vessels are forbidden to use what has become technically known among pilots as "cross signals," that is, answering one whistle with two, and answering two whistles with one. In all cases and under all circumstances, a pilot receiving either of the whistle signals provided in the rules, which for any reason he deems injudicious to comply with, instead of answering it with a cross signal, shall at once sound the danger signal and observe the rule applying thereto (Rule I).

Rule III. The signals for passing, by the blowing of the whistle, shall be given and answered by pilots, in compliance with these rules, not only when meeting "head and head," or nearly so, but at all times, when the steam vessels are in sight of each other, when passing or meeting at a distance within half a mile of each other and whether passing to the starboard or port.

The whistle signals provided in the rules for steam vessels meeting, passing, or overtaking are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow or heavy rain storms, when vessels cannot so see each other, fog signals only must be given.

## SECTION VII

## Tables and Data for Engineers

## HORSE POWER CALCULATIONS AND TABLES

E. S. Foljambe.

The subject of Horse Power of internal combustion motors is one that has been largely discussed, and we might say more abused than any other definite term connected with automobile engines. The term "Horse Power" in ordinary engineering practice is very specific, meaning one and only one thing, but in connection with the automobile industry it has been so loosely used that its utility has largely been lost. So much so that many never ask what the horse power of any engine may be, but simply inquire for the bore and stroke, making their own rough estimate as to the power that will be developed or ascertain approximately what results can be expected by the use of tables, large numbers of which have been published at various times and in various places.

Going back to the original meaning, a horse power is, of course, a measure of work. In other words, it represents 33,000 ft. lbs. of work per minute, or, as variously expressed, minute. It is a product of force in pounds times space in feet, and applies equally to the output of all engines.

## CALCULATED H. P.

To obtain the calculated horse power of any engine considering one cylinder only and multiplying its output, when obtained, by the number of cylinders, simply multiply the surface in square inches upon which the force in pounds acts, by the distance in feet through which it acts, thus obtaining foot-pounds, which, divided by 33,000 ft. lbs., will give the number of horse power. This rule, of course, applies to all types of machinery, and is perfectly accurate, but it must be understood does not in any way take into account the mechanical efficiency of the engine, or, in other words, does not take into consideration the amount of power absorbed in running the machine itself. To determine the actual useful horse power, that available for work, the mechanical efficiency of the machine must be considered. This naturally varying widely with the design and workmanship and type of motor, and although no general rule can be given, yet in well designed engines which are operated near the speed at which they are designed to give the best results, the mechanical efficiency may be taken as varying between 80 and 90%. Below 80 is not good; 90 or above is exceptionally good, and for motors of automobile type, from 15 H. P. upward, the efficiency can be assumed as about 85%.

Calculated horse powers are only approximate at best, and the actual horse power can only be determined by a brake test. Nevertheless, it is often a great assistance to be able to quickly approximate the output of any engine even before it is built, and for this purpose tables which are based on average practice and known performance of a large number of motors are given.

To calculate the horse power of any 4-cycle motor, the following general formula is always used, this giving the output of a single cylinder and must be multiplied by the number of cylinders for multiple cylinder engines.

$$\frac{P L A R}{33000 \times 2} = \text{H. P.}$$

In which

P=pounds per sq. inch.

L=length of stroke in feet.

A=piston area in inches.

R=the number of revolutions per minute.

The pressure in any engine is assumed to be a mean effective pressure or average pressure throughout the stroke, and is written M. E. P. For gasoline engines of the usual 4-cycle automobile type this pressure can be assumed at between 75 and 100 lbs., it, of course, varying with the general design. The actual M. E. P. of an engine which has already been built can be determined by the manograph, which records by means of a streak of light the outline of the indicator card, which, if desired, can be permanently retained by means of a photographic plate. It can also be determined at speeds under 500 R. P. M. by diagrams produced by ordinary steam engine indicators, but these are not accurate when used with high speed gasoline engines, the manograph being far superior.

For 2-cycle engines, in which the compression is usually lower than in the 4-cycle, an M. E. P. of not over 70 to 75 lbs. is usually used, and the 2 disappears from the denominator, as this type has a working stroke every revolution.

The speed at which the engine is running varies the number of working strokes per minute, and of course affects materially the resulting H. P. developed. Owing to this fact a practice has become customary of giving internal combustion motors a hyphenated rating; that is, stating the H. P. developed at a normal number of revolutions and also the horse power which the same engine would develop at a higher number of revolutions. For example, an engine is spoken of as 40-45 H. P. That is, it will develop 40 H. P. at say 800 revolutions and 45 H. P. at 1000 revolutions per minute.

#### AN EXAMPLE

Using the foregoing formula, we will calculate the indicated horse power (I. H. P.) of a 4-cylinder motor of 5-in. bore,  $5\frac{1}{4}$  stroke, assuming a mean effective pressure of 86 lbs. per sq. inch and the engine running at 1000 R. P. M.

The following values will be substituted in the formula:

M. E. P. lbs. per sq. in. or  $P=86$ .

Stroke in feet  $\frac{5.25}{12}$  or  $L=.437$  feet.

Area of piston 5-in. dia. or  $A=19.635$  sq. in.

Revolutions per min.  $R=1000$ .

Substituting these values in the formula:  $\frac{PLAR}{33,000 \times 2} = \text{H. P.}$

We have:  $\frac{86 \times .437 \times 19.635 \times 1000}{33,000 \times 2} = 11.18$  H. P. for one cylinder.

$11.18 \times 4 = 44.72$  H. P. for 4 cylinders.

The horse power available for useful work is obtained by multiplying this result by the mechanical efficiency assumed for the particular type of engine.

This formula can be simplified by gathering together all the functions which do not vary and making a constant of them. If 1000 rev. per min. is assumed, then the number of actual power strokes is 500. Instead of using the length of stroke in feet it can be used in inches and the dividing by 12 can be incorporated in the constant. Instead of using the area of the piston (area=.7854  $D^2$ ), its diameter squared can be used and the .7854 can also be placed in the constant. This constant then becomes .00098. For practical purposes the writer has considered this as .001, which gives results correct within .8 of one per cent. The advantage of this is at once apparent, as multiplying by .001 simply means pointing off three decimal places. Thus we have

#### A SIMPLE H. P. FORMULA.

H. P.= $PLD^2R$  with three decimal places pointed off.

In which  $P$ =Mean effective pressure.

$L$ =Stroke in inches.

$D$ =Diameter in inches.

$R$ =No. of cylinders.

The M. E. P. can be assumed or taken from tables. A speed of 1000 R. P. M. is the only assumption made, and the formula takes into consideration pressure, bore and stroke, and is the simplest form to which the writer has yet been able to reduce the H. P. formula, still retaining all the essentials.

By assuming a constant M. E. P. of 90 lbs. the formula can be simplified for a 4-cylinder 4-cycle engine to

$$\text{H. P.} = .36 LD^2.$$

If an approximation of the M. E. P. is desired, instead of taking an arbitrary value it may be calculated if the compression is known, by means of the following formula, given by Grover:

$$\text{M. E. P.} = 2 C - 0.01 C^2$$

in which  $C$ =the compression pressure above atmosphere in lbs. per sq. inch. This formula does not hold for compressions over 100 lbs. per sq. inch above atmosphere, but is fairly accurate for the range of pressures usually used in automobile work, giving, if anything, a conservative M. E. P. It must be borne in mind that atmospheric pressure must be deducted from this M. E. P., as the value of  $C$  is in lbs. per sq. inch above atmosphere.

The compression can be calculated if the cylinder volumes are known or can be taken from tables or curves. (See Compression Pressures in Gasoline Engine Cylinders.)

**WELL-KNOWN CLUB AND ASSOCIATION H. P. FORMULAE**

For easy comparison of one car with another and for facilitating handicapping at hill-climbs and race meets, the following formulae have been given out by clubs and associations. For the sake of uniformity, let:

$D^2$  = Square of piston diameter in inches.

$L$  = Stroke in inches.

$R$  = Revolutions per minute.

$N$  = Number of cylinders.

**H. P. FORMULA, 4-CYCLE ENGINES.**

$$\text{A. L. A. M. formula H. P.} = \frac{D^2 N}{2.5}$$

$$\text{Roberts Formula, H. P.} = \frac{D^2 L N R}{1800}$$

$$\text{Royal Auto Club, H. P.} = \frac{(D + L)^2 N}{9.92}$$

**RACING BOAT FORMULA.**

$$\text{American Power Boat Association} = \frac{D^2 N}{2.5338}$$

$$\text{For motors of less than 6 ins. stroke} = \frac{D^2 L N}{15.20}$$

These formulae are for high speed racing boat engines of 4-cycle type, and are based on 1000 ft. per minute piston speed.

For engines of ordinary design, 2-3 of the above values should be taken. 10% should be added to the ratings if the charge is forced into the cylinders by any mechanical device.

**2-CYCLE H. P. FORMULAE.**

The following are 2-cycle engine formulae, the first being by Roberts and the next two by the American Power Boat Association:

$$\text{H. P.} = \frac{D^2 L R N}{13,500} \quad (\text{For racing boat engines})$$

$$\text{H. P.} = \frac{D^2 N}{2.1008}$$

$$\text{H. P.} = \frac{D^2 L N}{12.987}$$

The above formulae by the American Power Boat Association are only for racing boat engines. For ordinary 2-cycle boat engines 2-3 of the value resulting from the use of these formulae should be taken. For engines having one or more displacer cylinders, the above rating should be increased in the ratio that the displacer pistons' displacement bears to that of the working cylinders.

It will be noticed that a 2-cycle engine having double the number of power strokes of a 4-cycle the H. P. would be multiplied by 2. This, however, would give an erroneous result, as there are many inherent conditions connected with 2-cycle engine design which tend to lower its H. P. output, such as the lower compression, lower M. E. P., due to inefficient scavenging, etc. For these reasons the output of 2-cycle engines varies more than it does in 4-cycle engines, and is very often taken as approximately 1.65 of that of a 4-cycle engine of the same bore and stroke. It must be understood, however, that there are exceptional cases where 2-cycle engines have shown considerably better than this, but we are, of course, considering average results.



## HORSE POWER TABLES FOR ONE CYLINDER

The accompanying table was prepared by Mr. Worby Beaumont, a well-known English Engineer.

The usual formula for calculating horse power was used in calculating this table, viz.:

### PLAN.

$$33,000 \times 2$$

When P equals mean effective pressure of 90 lbs. per square inch.

L equals stroke of engine in feet.

A equals area of piston.

N equals revolutions per minute.

**To use table:** Take the bore of your motor from marginal or left-hand column, follow directly across to the column whose heading added to the bore gives stroke. The figure at the intersection of this column and your bore column gives the horse power of one cylinder of that size at 750 revolutions, and the figure immediately below gives the horse power at 1000 revolutions, which is generally accepted for computing present day high-powered motors.

The table represents the calculated indicated power given by one cylinder. For multi-cylinder engines the power shown must be multiplied by the number of cylinders.

## BEAUMONT HORSE POWER TABLE

Cylinder Dimensions in Inches and Fractions of an Inch

Bore.	0	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	2
2	0.54	0.60	0.67	0.74	0.81	0.88	0.94	1.01	1.08
	0.72	0.80	0.89	0.98	1.08	1.17	1.25	1.35	1.44
$2\frac{1}{4}$	0.76	0.84	0.92	1.01	1.09	1.18	1.26	1.35	1.43
	1.01	1.12	1.22	1.34	1.45	1.57	1.68	1.81	1.90
$2\frac{1}{2}$	1.04	1.15	1.25	1.35	1.46	1.56	1.67	1.77	1.88
	1.39	1.53	1.67	1.81	1.95	2.09	2.23	2.37	2.51
$2\frac{3}{4}$	1.39	1.51	1.64	1.77	1.89	2.02	2.14	2.27	2.40
	1.85	2.02	2.19	2.36	2.53	2.70	2.87	3.04	3.20
3	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00
	2.40	2.60	2.80	3.00	3.21	3.40	3.61	3.81	4.00
$3\frac{1}{4}$	2.30	2.47	2.65	2.82	3.00	3.18	3.36	3.53	3.70
	3.06	3.28	3.52	3.76	3.99	4.22	4.45	4.70	4.92
$3\frac{1}{2}$	2.86	3.06	3.27	3.48	3.68	3.88	4.09	4.30	4.50
	3.81	4.09	4.36	4.63	4.90	5.18	5.45	5.72	6.00
$3\frac{3}{4}$	3.53	3.76	4.00	4.35	4.47	4.71	4.95	5.18	5.41
	4.71	5.02	5.34	5.65	5.97	6.28	6.60	6.91	7.23
4	4.27	4.65	4.81	5.08	5.35	5.61	5.89	6.15	6.41
	5.71	6.06	6.42	6.78	7.13	7.50	7.85	8.20	8.55
$4\frac{1}{4}$	5.13	5.44	5.74	6.04	6.34	6.64	6.95	7.25	7.55
	6.84	7.24	7.64	8.05	8.45	8.85	9.25	9.66	10.06
$4\frac{1}{2}$	6.19	6.53	6.87	7.22	7.56	7.90	8.25	8.59	8.93
	8.25	8.68	9.16	9.62	10.08	10.54	10.96	11.41	11.89
$4\frac{3}{4}$	7.18	7.55	7.94	8.31	8.70	9.07	9.45	9.82	....
	9.57	10.07	10.57	11.09	11.58	12.08	12.59	13.09	....
5	8.38	8.80	9.22	9.65	10.05	10.46	10.90	....	....
	11.16	11.72	12.28	12.84	13.40	13.95	14.50	....	....
$5\frac{1}{4}$	9.70	10.16	10.62	11.09	11.54	12.00	....	....	....
	12.02	13.54	14.15	14.76	15.40	16.00	....	....	....
$5\frac{1}{2}$	11.12	11.65	12.15	12.66	13.15	....	....	....	....
	14.84	15.51	16.20	16.86	17.54	....	....	....	....
$5\frac{3}{4}$	12.71	13.27	13.82	14.38	....	....	....	....	....
	16.06	17.70	18.42	19.19	....	....	....	....	....
6	14.45	15.05	15.65	....	....	....	....	....	....
	19.25	20.05	20.85	....	....	....	....	....	....

## BEAUMONT HORSE POWER TABLE

Cylinder Dimensions in Millimeter

Bore.	0	5	10	15	20	25	30	35	40
70	1.40	1.50	1.59	1.69	1.80	1.89	1.99	2.10	2.20
	1.87	2.00	2.13	2.26	2.40	2.53	2.66	2.80	2.94
75	1.72	1.84	1.95	2.07	2.18	2.29	2.41	2.53	2.64
	2.30	2.45	2.60	2.76	2.91	3.06	3.22	3.37	3.52
80	2.09	2.23	2.35	2.49	2.62	2.76	2.88	3.02	3.14
	2.79	2.97	3.14	3.32	3.49	3.67	3.84	4.02	4.19
85	2.43	2.65	2.80	2.95	3.09	3.24	3.30	3.54	3.69
	3.34	3.54	3.73	3.93	4.12	4.32	4.52	4.72	4.91
90	2.97	3.14	3.30	3.46	3.64	3.80	3.96	4.13	4.30
	3.96	4.18	4.40	4.62	4.85	5.06	5.28	5.50	5.72
95	3.50	3.68	3.87	4.05	4.24	4.42	4.61	4.80	4.98
	4.67	4.91	5.16	5.40	5.65	5.90	6.15	6.40	6.64
100	4.09	4.29	4.49	4.70	4.90	5.11	5.30	5.51	5.72
	5.45	5.71	5.99	6.26	6.53	6.81	7.07	7.35	7.62
105	4.73	4.95	5.17	5.40	5.63	5.85	6.08	6.30	6.53
	6.30	6.60	6.90	7.20	7.50	7.80	8.10	8.40	8.70
110	5.43	5.69	5.93	6.19	6.44	6.68	6.96	7.16	7.42
	7.23	7.58	7.90	8.25	8.57	8.90	9.23	9.55	9.90
115	6.22	6.48	6.77	7.03	7.30	7.56	7.85	8.11	8.37
	8.30	8.65	9.02	9.38	9.74	10.01	10.46	10.81	11.18
120	7.07	7.37	7.66	7.96	8.25	8.53	8.84	9.13	9.41
	9.42	9.82	10.21	10.61	11.00	11.39	11.79	12.18	12.57
125	7.97	8.30	8.63	8.94	9.25	9.57	9.89	10.21	10.54
	10.64	11.06	11.50	11.91	12.34	12.76	13.20	13.61	14.04
130	8.95	9.30	9.65	9.99	10.34	10.70	11.01	11.38	....
	11.94	12.40	12.86	13.31	13.79	14.25	14.70	15.16	....
135	10.08	10.44	10.80	11.18	11.56	11.92	12.30	....	....
	13.41	13.91	14.40	14.90	15.41	15.90	16.40	....	....
140	11.22	11.65	12.04	12.44	12.84	13.25	....	....	....
	14.99	15.51	16.05	16.60	17.12	17.68	....	....	....
145	12.52	12.98	13.41	13.82	14.25	....	....	....	....
	16.70	17.30	17.88	18.42	19.00	....	....	....	....
150	13.81	14.26	14.72	15.40	....	....	....	....	....
	18.41	19.01	19.64	20.23	....	....	....	....	....

## FORMULA FOR HORSE POWER REQUIRED TO OVERCOME AIR RESISTANCE\* (Brooks)

In the design of racing cars the horse power required to overcome the air resistance is a factor which should be taken into consideration. At speeds below fifteen miles per hour this resistance is practically negligible, and so need not of necessity be considered in low powered or ordinary touring machines. An approximate formula for calculating the horse power required to overcome the air resistance of a car is as follows:

$$H. P. = \frac{V^3 \times A}{240,000}$$

In which

H. P. = the required horse power.

V = velocity of car in ft. sec.

The projected area of the front of the car in sq. ft. may be approximated by multiplying the width of the car body at the front seat at the frame line, by the distance from the center of the wheels to the highest point either the wind shield, the seats or the top. This formula assumes still air; if the car is to be driven against a wind of known velocity, this velocity should be added to the car velocity.

\*This formula gives only the power required to overcome the air resistance of the car and should not in any way be confounded with formulas for calculating the actual horse power required to drive the car.

### A. L. A. M. HORSE-POWER FORMULA

The formula adopted is  $\frac{D^2 \times N}{2.5}$  and based on 1000 feet per minute piston speed. D is the cylinder bore, N the number of cylinders, and 2.5 a constant, based on the average view of the Mechanical Branch as to a fair conservative rating.

TABLE OF HORSE-POWER FOR USUAL SIZES OF MOTORS, BASED ON A. L. A. M. FORMULA

BORE		HORSE-POWER			
Ins.	M/M	1 Cyl.	2 Cyls.	4 Cyls.	6 Cyls.
2 $\frac{1}{8}$	64	2 $\frac{1}{8}$	5	10	15
2 $\frac{3}{8}$	68	2 $\frac{3}{8}$	5 $\frac{1}{2}$	11	16 $\frac{1}{2}$
2 $\frac{1}{2}$	70	3	6	12 $\frac{1}{10}$	18 $\frac{1}{4}$
2 $\frac{7}{8}$	73	3 $\frac{5}{8}$	6 $\frac{5}{8}$	13 $\frac{1}{4}$	19 $\frac{1}{8}$
3	76	3 $\frac{3}{4}$	7 $\frac{1}{2}$	14 $\frac{3}{4}$	21 $\frac{3}{4}$
3 $\frac{1}{8}$	79	3 $\frac{1}{2}$	7 $\frac{3}{8}$	15 $\frac{1}{2}$	23 $\frac{1}{2}$
3 $\frac{1}{4}$	83	4 $\frac{1}{4}$	8 $\frac{1}{2}$	16 $\frac{3}{4}$	25 $\frac{1}{2}$
3 $\frac{3}{8}$	85	4 $\frac{3}{8}$	9 $\frac{1}{8}$	18 $\frac{1}{4}$	27 $\frac{1}{4}$
3 $\frac{1}{2}$	89	4 $\frac{9}{10}$	9 $\frac{1}{2}$	19 $\frac{1}{2}$	29 $\frac{1}{2}$
3 $\frac{5}{8}$	92	5 $\frac{1}{4}$	10 $\frac{1}{2}$	20 $\frac{1}{4}$	31 $\frac{1}{2}$
3 $\frac{3}{4}$	95	5 $\frac{3}{8}$	11 $\frac{1}{4}$	22 $\frac{1}{2}$	33 $\frac{1}{4}$
3 $\frac{7}{8}$	99	6	12	24	36 $\frac{1}{16}$
4	102	6 $\frac{3}{8}$	12 $\frac{1}{2}$	25 $\frac{1}{2}$	38 $\frac{3}{8}$
4 $\frac{1}{8}$	105	6 $\frac{1}{2}$	13 $\frac{3}{8}$	27 $\frac{1}{4}$	40 $\frac{9}{16}$
4 $\frac{1}{4}$	108	7 $\frac{1}{4}$	14 $\frac{1}{2}$	28 $\frac{3}{4}$	43 $\frac{3}{8}$
4 $\frac{3}{8}$	111	7 $\frac{3}{8}$	15 $\frac{5}{16}$	30 $\frac{3}{8}$	45 $\frac{1}{8}$
4 $\frac{1}{2}$	114	8 $\frac{1}{10}$	16 $\frac{1}{2}$	32 $\frac{1}{2}$	48 $\frac{3}{8}$
4 $\frac{5}{8}$	118	8 $\frac{9}{16}$	17 $\frac{1}{8}$	34 $\frac{1}{4}$	51 $\frac{1}{2}$
4 $\frac{3}{4}$	121	9	18	36 $\frac{1}{10}$	54 $\frac{1}{10}$
4 $\frac{7}{8}$	124	9 $\frac{1}{2}$	19	38	57
5	127	10	20	40	60
5 $\frac{1}{8}$	130	10 $\frac{1}{2}$	21	42	63
5 $\frac{1}{4}$	133	11	22	44 $\frac{1}{10}$	66 $\frac{1}{5}$
5 $\frac{3}{8}$	137	11 $\frac{9}{16}$	23	46	69 $\frac{1}{16}$
5 $\frac{1}{2}$	140	12 $\frac{1}{10}$	24 $\frac{1}{5}$	48 $\frac{2}{5}$	72 $\frac{3}{5}$
5 $\frac{3}{4}$	143	12 $\frac{3}{8}$	25 $\frac{1}{5}$	50 $\frac{2}{5}$	75 $\frac{1}{5}$
5 $\frac{7}{8}$	146	13 $\frac{1}{4}$	26 $\frac{1}{2}$	53	79 $\frac{1}{2}$
5 $\frac{1}{2}$	149	13 $\frac{3}{16}$	27 $\frac{5}{8}$	55 $\frac{1}{4}$	82 $\frac{9}{10}$
6	152	14 $\frac{3}{8}$	28 $\frac{1}{2}$	57 $\frac{3}{4}$	86 $\frac{3}{4}$

To simplify reading of the above, the horse-power figures are approximate, but correct within one-sixteenth.

### COMPRESSION PRESSURES IN GASOLINE ENGINE CYLINDERS FOR VARIOUS RATIOS OF COMPRESSION SPACE TO TOTAL CYLINDER VOLUME

P. S. TICE

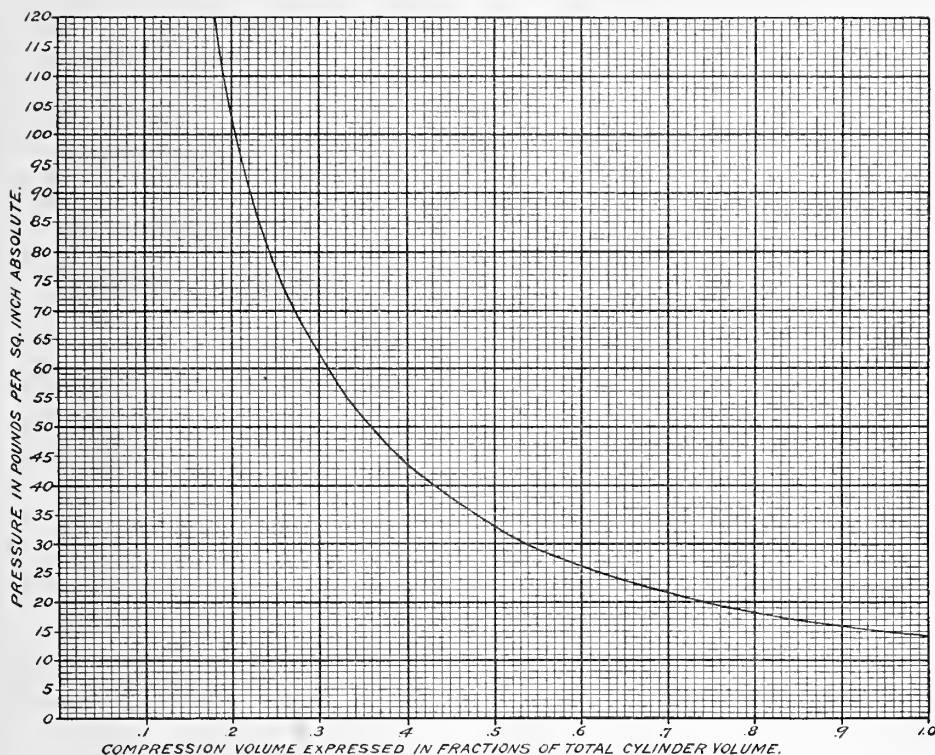
It is many times desirable to have at hand a convenient means for at once determining with accuracy what the compression pressure will be in a gasoline engine cylinder, the relationship between the volume of the compression space and the total cylinder volume or that swept by the piston being known.

The curve herewith is offered as such a means. It is based on empirical data gathered from upward of two dozen modern automobile engines and represents what may be taken to be the results as found in practice.

It is usual for the designer to find compression pressure values, knowing the volumes, from the equation

$$P_2 = P_1 \left( \frac{V_1}{V_2} \right)^{1.4} \dots \dots \dots 1$$

which is for adiabatic compression of air. Equation (1) is right enough in general form but gives results which are entirely too high, as almost all designers know from



experience. The trouble lies in the interchange of heat between the compressed gases and the cylinder walls, in the diminution of the exponent (1.4 in the above) due to the lesser ratio of specific heat of gasoline vapor and in the transfer of heat from the gases which are being compressed to whatever fuel may enter the cylinder in an unvaporized condition. Also, there is always some piston leakage, and, if the form of the equation (1) is to be retained, this also tends to lower the value of the exponent.

From experience with many engines, it appears that compression reaches its highest value in the cylinder for but a short range of motor speeds, usually during the mid-range. Also, it appears that, at those speeds at which compression shows its highest values, the initial pressure at the start of the compression stroke is from .5 to .9 lbs. below atmospheric. Taking this latter loss value, which shows more often than those of lesser value, the compression is seen to start from an initial pressure of 13.9 lbs. per sq. in. absolute.

Also, experiment shows that if the exponent be given the value 1.26, instead of 1.4, the equation will embrace all heat losses in the compressed gas, and compensate for the changed ratio of specific heats for the mixture and also for all piston leakage, in the average engine with rings in good condition and tight.

In the light of the foregoing, and in view of results obtained from its use, the above curve is offered—values of  $P_2$  being found from the equation

$$P_2 = 13.8 \left( \frac{V_1}{V_2} \right)^{1.26}$$

In using this curve it must be remembered that pressures are absolute. Thus: suppose it is desired to know the volumetric relationships of the cylinder for a compression pressure of 75 lbs. gauge. Add atmospheric pressure to the desired gauge pressure  $14.7 + 75 = 89.7$  lbs. absolute. Locate this pressure on the scale of ordinates and follow horizontally across to the curve and then vertically downward to the scale of abscissas, where the ratio of the combustion chamber volume to the total cylinder volume, which latter is equal to the sum of the combustion chamber volume and that of the piston sweep. In the above case it is found that the combustion space for a compression pressure of 75 lbs. gauge will be .225 of the total cylinder volume, or  $.225 \div .775 = .2905$  of the piston sweep volume.

Conversely, knowing the volumetric ratios, compression pressure can be read directly by proceeding from the scale of abscissas vertically to the curve and thence horizontally to the scale of ordinates.

## TABLE FOR CALCULATING B. H. P. OF AN ENGINE

Knowing the brake arm length, speed and pull on the scales. (C. T. Swart.)

$$\text{B. H. P.} = \frac{2 \times 3.1416 \times R \times P \times N}{33,000}$$

R = Brake arm in feet.

P = Pull on scales in lbs.

N = Revolutions per min.

$$\text{Values in table} = \frac{2 \times 3.1416 \times 100 \times R \times P}{33,000}$$

The figures in this table are for a speed of 100 revolutions per min.; therefore when readings are taken for any other speed, the answer found in the table must be multiplied by the actual speed divided by 100.

Pull in lbs.	ARM IN FEET									
	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	
5	.095	.119	.142	.166	.190	.214	.238	.261	.285	
10	.190	.238	.285	.332	.381	.428	.475	.522	.570	
15	.285	.357	.428	.498	.570	.642	.713	.783	.855	
20	.380	.476	.570	.666	.760	.856	.950	1.04	1.15	
25	.475	.595	.713	.830	.950	1.07	1.19	1.31	1.43	
30	.570	.713	.885	.996	1.15	1.28	1.43	1.57	1.71	
35	.665	.833	1.00	1.16	1.33	1.49	1.66	1.83	2.00	
40	.760	.952	1.14	1.33	1.52	1.71	1.91	2.09	2.28	
45	.855	1.07	1.28	1.49	1.71	1.93	2.14	2.35	2.56	
50	.950	1.19	1.43	1.66	1.90	2.14	2.38	2.61	2.85	
55	1.05	1.31	1.57	1.83	2.09	2.35	2.61	2.87	3.14	
60	1.15	1.43	1.71	2.00	2.28	2.57	2.85	3.13	3.42	
65	1.24	1.55	1.85	2.16	2.47	2.78	3.09	3.39	3.71	
70	1.33	1.66	2.00	2.33	2.66	3.00	3.33	3.66	4.00	
75	1.43	1.78	2.14	2.49	2.85	3.21	3.57	3.92	4.27	
80	1.52	1.90	2.28	2.66	3.04	3.42	3.80	4.18	4.56	
85	1.62	2.02	2.42	2.83	3.23	3.64	4.04	4.44	4.85	
90	1.71	2.14	2.56	2.99	3.42	3.85	4.28	4.70	5.14	
95	1.81	2.26	2.71	3.16	3.61	4.06	4.52	4.96	5.42	
100	1.90	2.38	2.85	3.32	3.80	4.27	4.75	5.22	5.71	
105	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	
110	2.10	2.62	3.14	3.65	4.18	4.70	5.23	5.75	6.27	
115	2.19	2.74	3.28	3.82	4.37	4.92	5.47	6.01	6.66	
120	2.28	2.86	3.42	3.98	4.56	5.14	5.71	6.27	6.85	

TABLE FOR CALCULATING THE I. H. P. OF ONE CYLINDER  
FOUR CYCLE ENGINES \*

Knowing the piston speed, piston diameter and M. E. P. (C. T. Swart.)

I. H. P. (four cycle) =  $\frac{P \times L \times A \times N}{33,000 \times 2}$

P = M. E. P.  
L = Length of stroke in feet.  
A = Area of cylinder in sq. ins.  
N = No. of revolutions per min.

Piston Speed = 2 x L x N.

Hence I. H. P. =  $\frac{P \times A \times \text{Piston Speed}}{33,000 \times 4}$

The figures in this table are for a piston speed of 1000 feet per min.; therefore for any other piston speed the number found in the table must be multiplied by the actual speed divided by 1000.

M.E.P.	BORE													
	3"	3 1/4"	3 1/2"	3 3/4"	4"	4 1/4"	4 1/2"	4 3/4"	5"	5 1/4"	5 1/2"	5 3/4"	6"	6 1/2"
20	1.07	1.27	1.46	1.68	1.91	2.15	2.41	2.68	2.98	3.28	3.60	3.94	4.30	5.03
25	1.34	1.57	1.83	2.10	2.38	2.69	3.01	3.36	3.72	4.11	4.50	4.92	5.37	6.28
30	1.60	1.89	2.19	2.52	2.86	3.23	3.62	4.04	4.47	4.93	5.40	5.91	6.45	7.55
35	1.87	2.20	2.56	2.93	3.34	3.76	4.22	4.70	5.22	5.75	6.30	6.89	7.52	8.80
40	2.14	2.51	2.92	3.35	3.82	4.30	4.82	5.38	5.96	6.57	7.20	7.88	8.60	10.00
45	2.41	2.83	3.28	3.77	4.28	4.84	5.43	6.05	6.70	7.39	8.10	8.87	9.69	11.3
50	2.67	3.14	3.65	4.19	4.76	5.38	6.03	6.72	7.45	8.21	9.00	9.86	10.7	12.5
55	2.94	3.45	4.02	4.61	5.24	5.92	6.63	7.40	8.19	9.03	9.90	10.8	11.8	13.8
60	3.20	3.76	4.38	5.03	5.72	6.46	7.23	8.06	8.93	9.85	10.8	11.8	12.9	15.1
65	3.47	4.08	4.75	5.45	6.20	7.00	7.84	8.74	9.68	10.7	11.7	12.8	13.9	16.3
70	3.74	4.40	5.12	5.87	6.67	7.53	8.44	9.42	10.4	11.5	12.6	13.8	15.0	17.6
75	4.01	4.71	5.48	6.29	7.15	8.07	9.04	10.1	11.2	12.3	13.5	14.8	16.1	18.8
80	4.27	5.03	5.85	6.71	7.62	8.60	9.64	10.8	11.9	13.2	14.4	15.8	17.1	20.0
85	4.54	5.34	6.20	7.13	8.10	9.14	10.2	11.4	12.6	14.0	15.3	16.7	18.2	21.3
90	4.82	5.65	6.57	7.55	8.56	9.68	10.8	12.1	13.4	14.8	16.2	17.7	19.3	22.6
95	5.08	5.97	6.94	7.96	9.05	10.2	11.4	12.8	14.1	15.6	17.1	18.7	20.3	23.9
100	5.35	6.30	7.30	8.38	9.53	10.7	12.0	13.4	14.9	16.4	18.0	19.7	21.4	25.1

\*For 2 cycle engines multiplying the figures in the table by two would be correct theoretically, but multiplying by 1.65 gives results closer to actual practice.

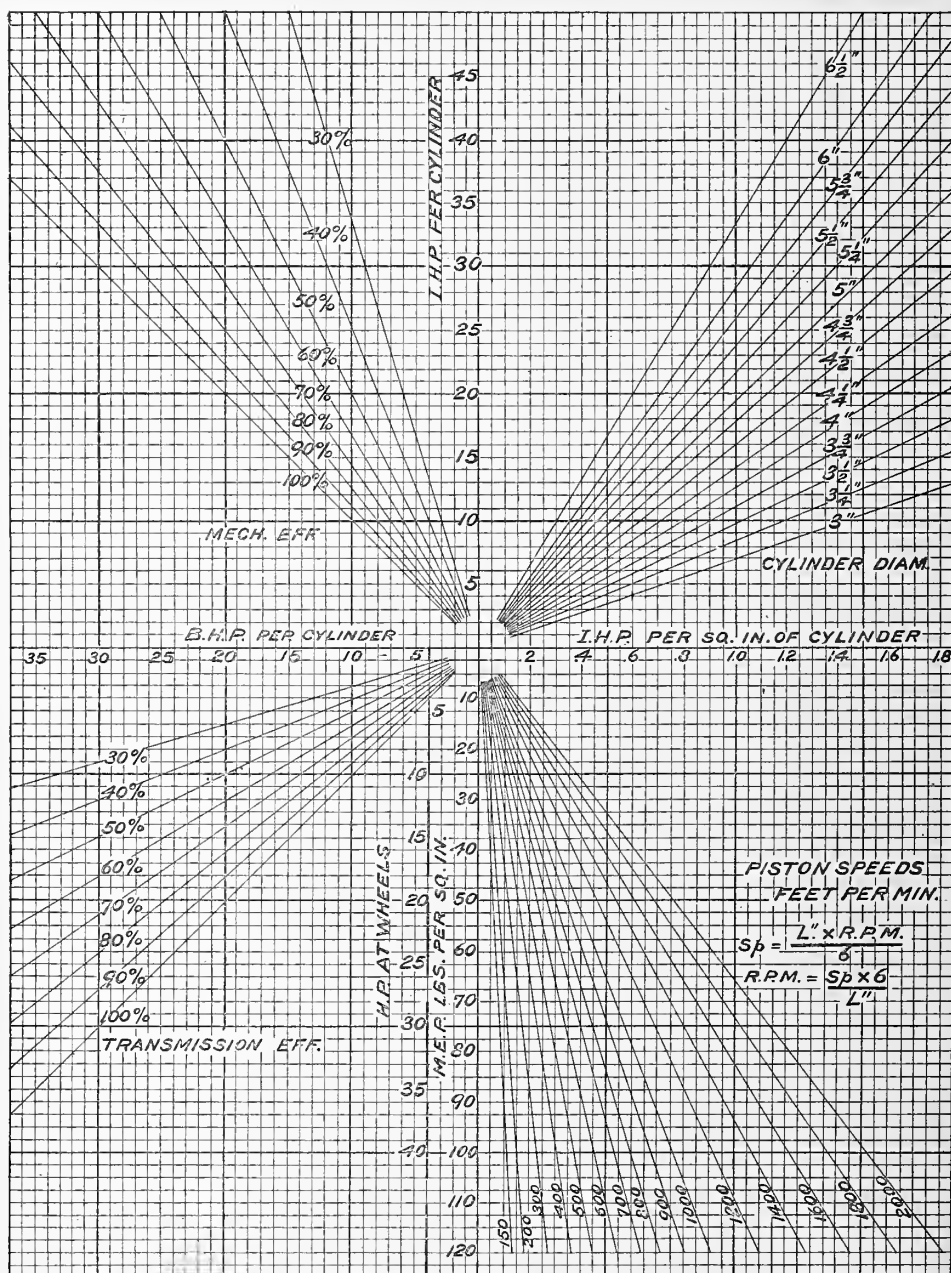


CHART A.

**DATA CHARTS**

BY P. S. T. AND C. T. S.

The three charts herewith, dealing with engine horse power, and with engine and car speeds, are presented with a view to facilitating the work of anyone who may have occasion to frequently determine closely approximate engine powers referred to cylinder sizes, cylinder dimensions referred to power, gear ratios, etc.

Taking chart A, engine power, it will

be noted that the chart as a whole is divided into four sections by vertical and horizontal co-ordinates, at whose intersection is found the center from which radiate the several sets of diagonals. This center point also serves as the zero point of the scales laid off on the co-ordinates.

In chart A, a scale of mean effective pressures (M.E.P.) in lbs. per sq. in. is found along the lower half of the ordinate. M.E.P. is that pressure which acts upon



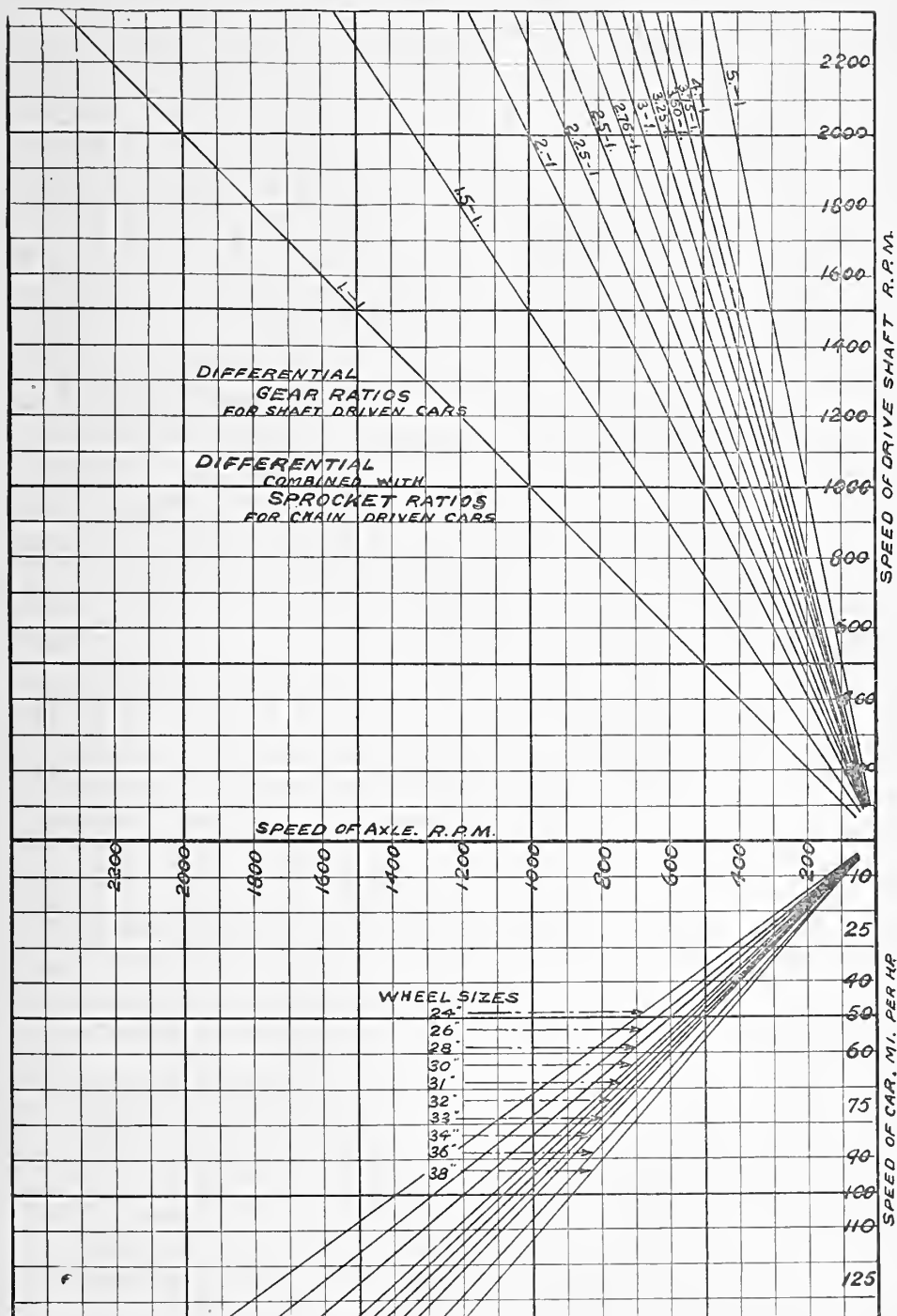


CHART C.

each sq. in. of piston area throughout the working stroke of the engine, and this quantity multiplied by the linear speed of the piston in ft. per min. gives the work done per working stroke in foot lbs. Dividing this latter quantity by 33,000 ft. lbs. (the equivalent of one horse power) reduces the ft. lbs. of work done to indicated

horse power (I.H.P.) per sq. in. of piston area. Knowing or assuming the M.E.P. for a given engine and conditions (M.E.P. is found in practice by dividing the area of the indicator card by its length) and having located this value on the scale of M.E.P., a horizontal line drawn to intersect the diagonal representing the piston speed

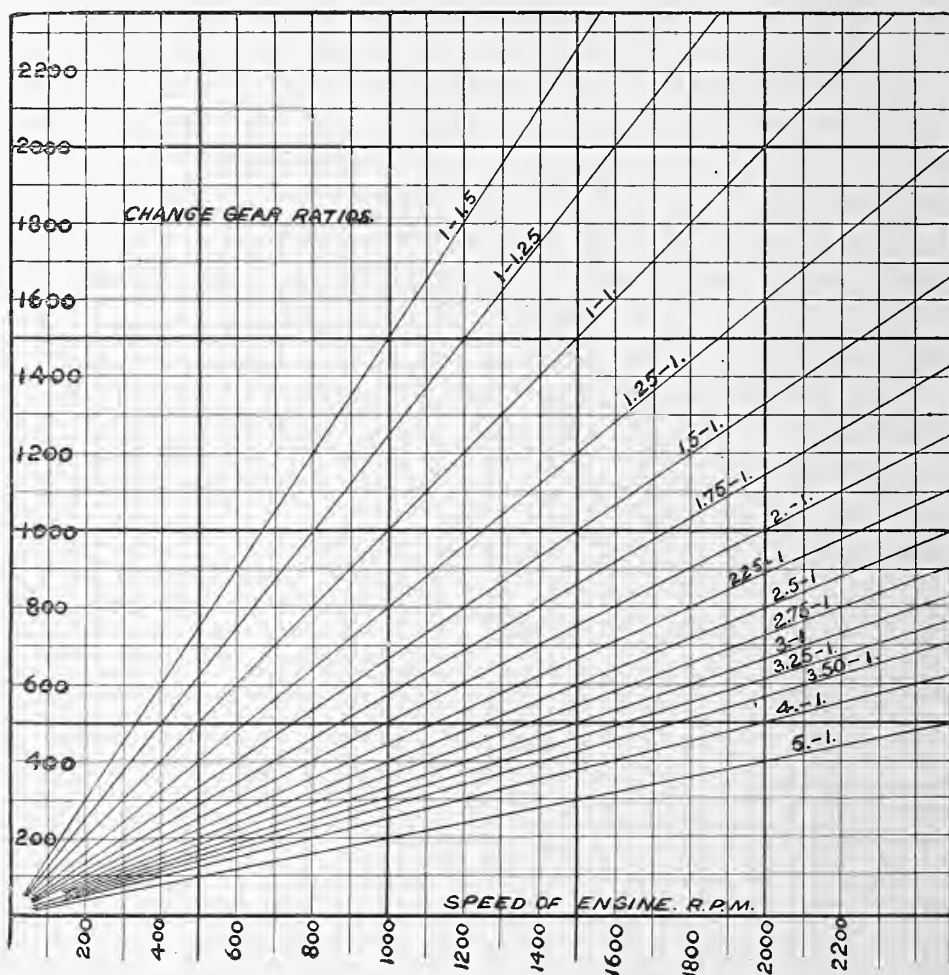


CHART D.

at which the engine is operating, and extended vertically from this intersection to the scale of I.H.P. per sq. in. of piston area, at once locates the latter value.

Producing this line until it meets the diagonal of cylinder diameter or bore, and following horizontally to the left from this intersection locates the I.H.P. per cylinder, for the given M.E.P. and piston speed. Continuing this horizontal to the left until it meets the proper diagonal of mechanical efficiency (M.Eff.) and from this point downward, locates the B.H.P. per cylinder. Passing similarly through the transmission efficiency, one arrives at B.H.P. per cylinder delivered at the car wheels.

Obviously, one may start at any scale on the chart and work around to any other scale, either reversing the above course and starting with B.H.P. at the wheels to find M.E.P. and piston speed; or, starting at this same point or at engine B.H.P. to find cylinder bore, piston speed and M.E.P., etc. In fact the various uses to which the chart may be put are almost infinite.

For use in two-cycle determinations, when working through M.E.P. and piston speed, the value of I.H.P. per sq. in. of cylinder area should upon arrival at that scale be doubled before proceeding vertically to the cylinder diameter diagonals. In coming from the other direction, from the cylinder bore diagonals to the I.H.P. per sq. in. scale, the value found on the scale for I.H.P. per sq. in. must be divided by two before proceeding to the piston speed diagonals.

The chart B is one of rotative speeds referred to gearing ratios, and is useful in determining how fast a car will run with a given engine speed, change gear reduction, driving gear reduction and wheel size; or, to reverse the above, how fast the engine must turn to propel the car at a given speed with given gearing ratios. Obviously, knowing the car speed and engine speed the gearing ratios can be determined at a glance. The several ways and directions in which this chart can be of service will readily suggest themselves to the reader.

# Elementary Electricity Helpful to an Understanding of Automobile Ignition

E. S. FOLJAMBE

The subject of ignition is probably one of the most perplexing to automobile owners and unfortunately is usually one of the things the mechanism of which is modified or re-arranged by them more than any other part of the car. In order to intelligently deal with modern motor car ignition devices, a certain amount of elementary electrical knowledge must be had; for this purpose a very elementary treatise on the subject is herewith given with the hope that it may be of benefit.

No attempt will be made to go into the more complex theories but simply a brief explanation of the simpler forms of apparatus and simple definitions of some of the terms most commonly used will be given.

## Analogies to Flow of Water.

Electrical currents are said to flow through conductors, these conductors being metallic wires, German silver, copper or aluminum, those used in connection with automobile work usually being of copper. The exact action is not known but it is generally conceded that a current does not pass through the body of the metal so much as that it follows the surface. To convey a clearer idea of the action of an electrical current we will use the time worn but applicable method of comparing the current with the flow of a liquid through a pipe. These analogies although not strictly true are close enough for our purpose. A liquid in a pipe is said to be under a certain pressure which causes motion in the liquid, this pressure being caused by difference in level of the source and outlet or by a pump. In the same way an electrical current has pressure or voltage caused by difference in what is known as potential\* between the source and the outlet. So we have:

**Volts†** = unit of pressure, dependent upon difference of potential.

**Lbs. per sq. in.** = unit of pressure, dependent upon difference in level.

The amount of water passing a given point during a given time is known as the rate of flow in gallons per minute, etc. Similarly a current has a rate of flow which is measured by a unit known as an "ampere" which represents quantity just as in a water pipe. The quantity of water is dependent upon the pressure forcing the water through and upon the resistance of the pipe or conductor. In the same way the number of amperes depends upon the voltage (pressure) and upon the resistance to the passage of the current. So again we have:

**Ampere** = unit of rate of flow, dependent upon voltage and resistance.

**Gallons per minute** = unit of rate of flow, dependent upon pressure and frictional resistance.

The resistance to the flow of the current is measured by "Ohms" and is dependent on diameter, material length and temperature of the wire, etc., in exactly the same way that the flow of the water is resisted by friction, dependent upon the size, shape and length of the conducting pipe. Therefore we may say:

**Ohm** = unit of resistance, dependent upon diameter, material and length of wire.

**Coefficient of friction** = unit of frictional resistance dependent upon, diameter, shape and length of pipe.

## SOURCES OF ELECTRICITY.

The two general methods employed for producing currents are by the conversion of mechanical energy or by chemical action. Wet cells, dry cells and storage batteries come under chemical and dynamos and magnetos under mechanical methods.

If two elements such as carbon and zinc or copper and zinc are immersed in a bath of an exciting fluid such as sulphuric acid and water and the elements connected by a conducting metal, a chemical action takes place resulting in the flow of a current from the carbon or copper element through this wire to the zinc. This device is called a wet or galvanic cell and several of them a battery.

A dry cell is practically the same except instead of using a liquid a sort of paste is employed. This consists of sal ammoniac (ammonium chloride) and water mixed with carbon dust, sawdust, black oxide of manganese, plaster of paris, etc., various combinations being used, and saturated with the exciting fluid, forming a semi-fluid mass, so the cell cannot be spilled. Carbon and zinc elements are usually used, the zinc forming the retaining cylindrical shell and the carbon in the form of a rod is placed in a vertical central position concentric with the shell. The chemical action dissolves the zinc and the result is a formation of free hydrogen gas which is liberated at the carbon element or pole and if not prevented the carbon becomes covered with bubbles of this gas or is "polarized" and stops the action. This the black oxide of manganese prevents by combining with the hydrogen. The top of the cell is sealed by means of tar, pitchy substances, or wax.

\*Potential at any point is the work that must be spent upon a unit of positive electricity in bringing it up to that point from an infinite distance.

†Practical units and standards see page 546.

A storage cell does not generate but simply stores and consists of a few lead plates filled with a special paste, the plates being separated so they cannot touch each other. The cell is filled with electrolyte which is sulphuric acid and water, and when charged part of the material of the cell has undergone a chemical reaction, the reverse of this action taking place when the cell is again discharged (see care and charging of storage batteries). A number of such cells connected form a battery, and may be used to drive a car or for lighting purposes.

#### INDUCTION.

Experiment has shown that when a current is passed through a wire a certain change is produced in the surrounding medium causing what is known as a "magnetic field" and that by winding this same wire into a helix produces another change in the field. If now a bar of soft iron or preferably a bundle of soft iron wires are placed inside this helix this bundle of wires or core is converted into a magnet having a north and south pole and the field inside the coil is also intensified. Furthermore, if another coil of wire is wound around the outside of the first coil or helix but not touching it, it is found that a current is produced or "induced" in it each time the current in the inside or primary winding is broken. The outside coil of wire is known as a secondary winding. If the ends of this secondary winding are slightly separated at the time of the breaking of the primary current, it is found that the induced current will spill over so to speak, or in other words, make itself manifest at the opening as a spark. The finer the wire of this outside winding and the larger the number of turns the higher the voltage of the induced current and the better and larger the spark will be. Upon this principle is based the jump spark system of ignition. (See Ignition and Wiring Diagrams.)

#### THE DYNAMO AND MAGNETO.

In any "field" such as that produced around and inside a coil of wire through which a current flows or between the poles of any magnet either electrical or permanent, there are invisible lines of force. The lines of force in such a field arrange themselves in a definite shape around and between the poles and if they are cut in any way by moving a wire across them, a current is produced in the wire and this current depends largely upon the number of these lines of force which are cut per second. It makes no difference whether the wire is held stationary and the magnet and, its field moved, or whether the wire itself is moved and the field is stationary. The result is the same as far as producing the current is concerned. The utilization of this principle is the basis upon

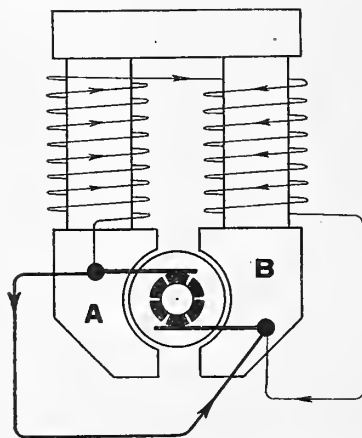


FIG. 1

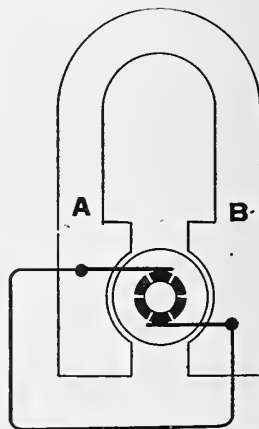


FIG. 2

which dynamos and magnetos or mechanical producers of current are made. In Fig. 1 is a diagrammatic view of a simple dynamo. The pieces A and B are electro magnets, or, in other words, are caused to be magnetos by means of a small current known as a "shunt" made to pass around each of them as shown. This shunt current is really a small part of the current developed by the machine itself. The ends of these two pieces are poles and between them is the magnetic field. In this field is rotated an axis or armature upon which wires are wound so that in rotating the wires or windings are continually cutting through the lines of force between the pole pieces and thus currents are generated in these wires. As the rotation of the armature causes in the small wires wound around it, currents which flow in opposite directions, these currents are then gathered so they will flow in one direction through the outside circuit where the current is used for work, the gathering being done by brushes which rub on the end of the armature on a piece known as the commutator. This commutator consists of small segments of copper to which the ends of the various wires of the armature winding are connected and the brushes are so arranged that they touch the copper pieces

connected with the proper wires so that a direct current will flow through the outside circuit.

In Fig. 2 is a sketch of a magneto. Again A and B are magnets but in this case permanent magnets so that no shunt current is required this being the chief distinction between a magneto and dynamo, the magneto having permanent magnets while the dynamo has electro magnets. An electrical field exists between the poles or ends of the permanent steel magnets. A revolving armature with its conducting wires wound upon it as before, cuts the lines of force of this field producing currents of different direction, but again due to the commutator a direct current is obtained.

The strength of the current generated is dependent upon the size of the wire, the strength of the magnetic field and the number of turns of wire and the speed with which the armature is rotated, or, in other words, the number of lines of force which will be cut per second. The greater the number, the greater the current strength. For this reason the shunt current in the dynamo increases rapidly as the speed of the machine increases thereby increasing the magnetism of the electro magnets and consequently their field, so that the strength of current will increase more rapidly in this type of instrument with the speed at which it is run, than it will on a magneto, in which the strength of the magnets is a constant quantity. To overcome this difficulty with the dynamo, of too rapid an increase in current strength, a governor is often supplied which in various ways is arranged to prevent the instrument from being rotated too rapidly. This is particularly necessary on dynamos used for automobile ignition as they must be run fast enough even at low engine speeds to give a good sparking current and yet not burn out when the engine is speeded up. As to source of current, either one of these instruments can be used exactly as though it were a storage or dry battery.

Magnetos may be divided into two general classes, low and high tension. The low tension magneto consists of the usual permanent magnets and an armature with a primary winding only the current is broken at the instant of its maximum intensity. Still other low tension magnetos are fitted with a timing device and the current can be broken when desired within a certain range giving a means of advancing or retarding the time of ignition.

The high tension magneto has an armature provided similarly to a coil with both a primary and secondary winding. The secondary winding is wound on the outside of the primary but insulated from it and consists of many turns of fine wire. These instruments are fitted with either a mechanical or magnetic breaker which produces an inductive effect in the secondary winding. No external coil is of course necessary. Splitdorf, Simms-Bosch and Giamoli magnetos are modelled on this principle. Another high tension system consists in using what is practically a low tension magneto the current of which is passed through an induction coil fitted with a mechanical breaker. The Holley and the Eisemann employ this system.

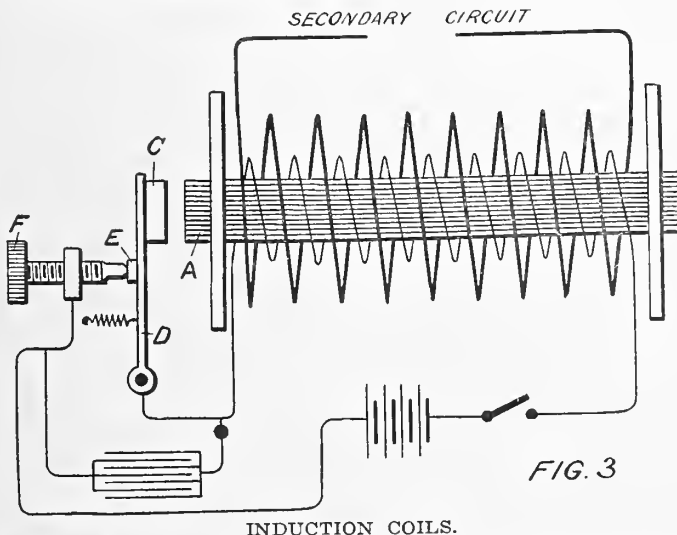


FIG. 3

#### INDUCTION COILS.

The fact has been previously mentioned that when two coils are wound one around the other and the circuit made or broken in the inner or primary coil, an induced current is created in the outer or secondary winding, the voltage and the amperage depending upon the relative number of turns of wires and their size. The use of a soft iron core in the center, concentrates the magnetic field inside of the primary winding.

Now, as the spark is forced to jump the opening or gap in this secondary winding only when the circuit of the primary winding is broken; in order to get a rapid series of sparks it is necessary to rapidly make and break the primary circuit. This has led to the use of what is known as a vibrator. Diagram Fig. 3 gives an idea of this device. As the core of soft iron wires "A" is simply a magnet during the time that current is flowing through the primary winding around it; if this current is alternately made and broken the core also becomes magnetized or loses its magnetism, etc. This intermittent magnetizing of the core is used to operate the small piece C at the end of the spring D in such a way that when the spring in its normal position is touching point E the position of which is adjustable by means of a screw F, the current from the battery G flows through the wire as shown by the arrows, thus magnetizing the core, but the instant the core becomes a magnet the piece C at the end of the vibrator is drawn over against its end and separates the spring D from the point E thus breaking the primary circuit, causing the core to lose its magnetism and therefore piece C under the action of its spring flies back again against E, again making the circuit which causes C to be drawn over again to the core thus breaking it. This action continues with great rapidity as long as current is supplied to the primary winding. In automobile ignition, current is only supplied to this winding at the time when a spark is required in the cylinder of the engine. The making or closing the primary current at a suitable time is taken care of by what is known as the "timer" which is simply a rotating piece connected with the source of current and which rubs or rolls into contact with suitable metallic pieces imbedded in insulating material and to which are attached wires running to the primary windings of the coils. The timer is rotated synchronously with the engine and driven by it. During the instant that the timer allows the current to flow, the vibrator, as before explained, rapidly makes and breaks the circuit thus causing instead of a single spark, a series of sparks to jump the gap of the secondary winding. Without the vibrator simply one spark would be obtained at the breaking of the circuit by the timer but many prefer the more complicated vibrating coil as it is supposed that this rapid series of sparks is more apt to cause ignition of the charge. Lately, more and more devices have been placed on the market which give but a single spark, which of course are more economical of current than those in which a longer contact is made in the primary circuit.

#### How to Adjust a Vibrating Coil.

Good coils, when properly adjusted, consume about  $\frac{1}{4}$  to  $\frac{1}{2}$  ampere for each engine cylinder. By screwing down the points too close the current consumption may be greatly increased to the detriment of the mileage and without any advantage. Therefore, it is advisable to see that the coil is adjusted so as to take no more current than is necessary. To do this connect an ammeter in the place usually left for a connection on a coil, or insert the ammeter in the battery connection, so that the current flows from the battery through the ammeter to the coil. Place a piece of paper under all but one of the vibrator points with the engine running. Adjust this point until the current taken by its cylinder is a minimum, without, however, any tendency to miss explosions. If the engine will not run with only one cylinder working, the current taken by each contact point may be determined by blocking this one point off with a piece of paper and noting the change in the current that this causes. Adjust the point and try this again, until you get the lowest current consumption on which the engine will run properly.

The proper voltage for a battery in most cases is 6 volts. If you have been using dry cells a six-volt battery is to be used in place of 6 dry cells, and an eight (8) volt battery in place of 8 cells, etc.

#### THE CONDENSER.

In every coil there is what is known as a condenser, the action of which greatly intensifies the secondary spark. This device consists of sheets of tin-foil placed one on top of the other but separated by parafined paper or other insulating material. The edges of every alternate sheet are in electrical contact so that the condenser sheets are like the tines of two forks with their handles placed away from each other and their prongs interspaced but not touching each other. The condenser is connected across any interrupting device such as a vibrator, one wire joining the circuit at one side of it and the other at the other side but this does not short circuit the breaker or vibrator as the two sets of tin-foil are not in contact.

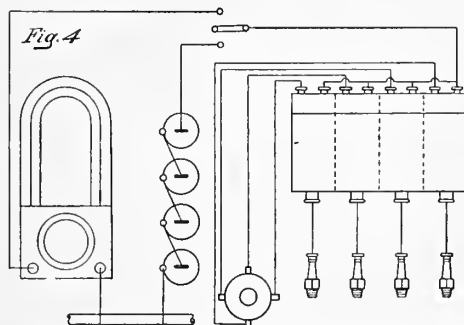
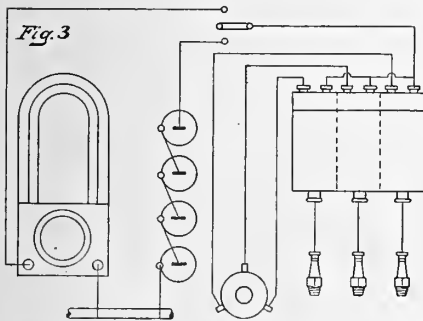
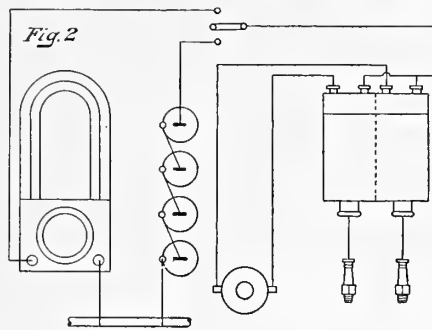
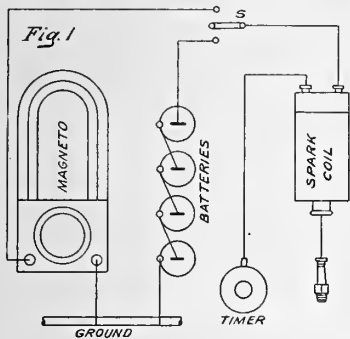
The action is something as follows. When any primary circuit is broken there is a decided tendency to set up a spark at the break which in the make and break system is intensified and used but in the jump spark high tension system this tendency to spark in the primary reduces the efficiency of the spark generated in the secondary winding. A peculiar action of the condenser, is that temporarily, it absorbs so to speak the wave or impulse in the primary which causes this spark so that the spark is greatly reduced or completely eliminated. However, there is instantly a reverse action and the stored

up energy in the condenser with extreme rapidity flows back and adds its quota to produce a larger spark in the secondary.

The actual construction of the parts of the coil will not be here dealt with. Suffice it to say that the iron core is usually mounted in two pieces of insulating material and covered with an insulating sleeve around which a primary coil of wire is wound. Around the outside of this is another insulating sleeve of parafine paper, mica, fibre tube, etc., on the outside of which a secondary winding of very fine wire is placed. The only adjustable part is the screw F which limits the action of the vibrator. This can be turned up or down until the spark at X or at the plugs is best. As the amount of current used by the coil largely depends upon this setting, the vibrators should not be tampered with unless it is known that the setting is incorrect. Dry batteries are often very rapidly run down and exhausted due to an incorrect and wasteful setting of the vibrators. When properly adjusted an ammeter in circuit should never show over  $\frac{1}{2}$  ampere.

#### Wiring with Diagrams.

With this brief and elementary description of the devices used, we will now take up the subject of wiring. It will be noticed that the primary circuit may have as a source, batteries, dynamo or magneto, or both if desired; that in the primary circuit there must be a timer or automatic device for opening and closing the circuit at the correct time, also as the engine might stop in a position which would leave the current flowing there should be a hand or foot switch. Thus we have in the primary circuit a



source of supply, a switch, a timer, and the primary winding of the coil. The secondary circuit consists simply of the secondary winding of the coil the gap in this secondary circuit being inside of the engine. This gap usually takes the form of a spark plug which is screwed into the engine making a metallic contact with it. One end of the secondary wire is connected to the plug at the end of a central piece called an electrode which is entirely insulated from the rest of the plug and therefore from the engine. The other end of the secondary wire is always in one manner or another grounded or connected with the engine so that the space between the central electrode of the spark plug and the edge of the plug, which is virtually a part of the engine as it is in metallic contact with it, form a gap across which the secondary spark jumps. In general, the secondary wires are distinguishable by having a very heavy, large insulation which is necessary as this secondary current is of high voltage which as we have learned causes it to readily short circuit. The primary winding on the other hand, carries current of greater amperage but much less voltage and does not give the same trouble as the secondary; or, in other words, there is not the same tendency for the current to short circuit or get back to the source by some shorter, easier route than that of following the wire; therefore, smaller insulation is sufficient.

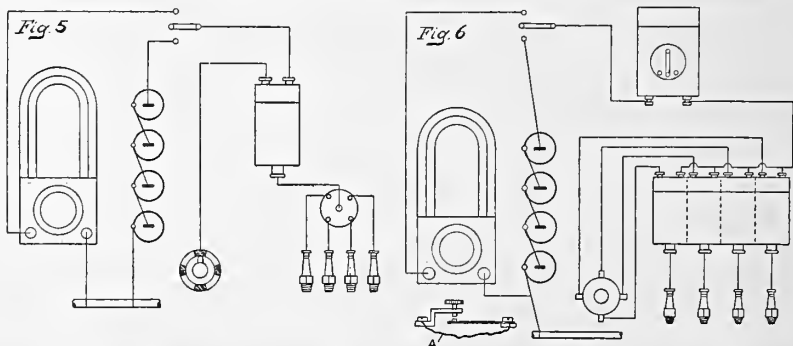
It must be remembered that both the primary and secondary wires each form a complete circuit, the primary as shown going from the battery through the switch, the



coil, the timer and back to the battery through a ground wire on the engine or frame of the machine. This ground in the case of a magneto is sometimes made by the base of the instrument itself through its fastening to the engine. In the same way a complete circuit of the secondary wire is formed by one end going to the spark plug and the other end being grounded. However, very few coils have a visible secondary ground wire dispensing with this extra wire by a connection inside the coil to the ground wire of the primary circuit there being but one secondary wire visible from each coil to a plug. It is customary to connect the negative or zinc terminal of the source of supply to the ground while the positive wire is carried to the switch, coil, timer, and as the timer is on the engine itself, back through the engine, through the ground wire to the battery. In Fig. 1 is shown a diagram for the wiring of a single cylinder motor for jump spark. B is the battery, M the magneto or dynamo, S the switch, C the coil, T the timer and P the plug in the cylinder. G is the ground wire well connected to any part of the engine or frame, preferably, however, on the engine at a point where the current will have as few lubricated joints to pass as possible. The high tension or secondary wire the other end of which is not shown is grounded through the primary by a connection on the inside of the coil box. The switch may have one, two or three throws; that is, the movable part may be so arranged that it will connect with any one of three buttons or so when placed between two buttons it will touch each connecting up two sources of supply at the same time. In another position the movable arm does not touch any of the buttons, which of course is an off position, no current flowing.

#### TIMERS.

The timer (or sometimes called commutator, which term, however, should be reserved for designating the device at the end of an armature) usually consists of a rotary part carrying a metallic contact which at suitable positions rubs the electrical contacts of the stationary part thereby causing a current to flow in the primary circuit. Sometimes, especially for single cylinder engines, the timer consists of a cam which at the proper time pushes a spring so that it momentarily makes contact with a stationary point, thus allowing the current to flow. This device is mounted on the cam shaft or half-time shaft or on any part of the mechanism which is rotated at half the speed of the engine shaft, thus giving a contact once in every two complete revolutions of the engine or one contact for every four strokes of the piston as required for four-cycle engines. In the two stroke cycle or two-cycle engine, the timer can be placed directly on the engine shaft as it then gives one contact for each revolution or every



two strokes. On two-cylinder engines of the four-cycle type, two contacts diametrically opposite are placed. For three-cylinder engines, three contacts equally spaced or 120 deg. apart are used and on four-cylinder engines, the timer has four contacts at exactly equal spaces around the circumference and so on for any number of cylinders. Referring again to wiring diagram Fig. 1, when switch S is closed, the current flows from the battery through primary windings to the coil; from the timer when the contact is made, through the engine and back through the ground wire to the battery, completing the primary circuit. As soon as the primary circuit is closed by the timer, the vibrator begins to operate on the coil and induced currents of high voltage are produced in the secondary winding. This secondary current passes from the coil to the plug central electro, jumps to the edge of the plug which is the same as the engine, causing the spark and passes back through the engine by means of the ground wire to the coil thus completing the secondary circuit. It is practically a matter of indifference which way the current flows except that at the time of breaking the circuit the spark jumps from the positive to the negative, pitting the positive surface due to the carrying away of small particles of the metal. For this reason the current is usually directed in such a way that the part of the timer most easily renewed will be the part pitted, this being in general the movable contact. Some recommend the reversal of the direction of the

current every few days so that the pitting will not be all on one side, and switches are now made which will permit of the reversal or changing of the polarity.

Fig. 2 shows the wiring of a two-cylinder engine the arrangements being exactly the same, except the wire which runs to the coil is branched, going into each of the coils or, as is often done, the wire simply runs to a main terminal of the coil and by an internal connection is carried over to the second coil. The timer in this case of course has two contacts. From the ends of the secondary windings, wires are carried to each of the plugs, the other ends of these windings being internally connected and grounded as previously mentioned. Diagrams for three and also for a four-cylinder engine are shown. The general principle being exactly the same regardless of the number of cylinders. Simply additional coils with their secondary windings connected to the plugs are used. In Fig. 5 is shown the diagram of the wiring for a four-cylinder engine but using a single coil. This is accomplished by means of a device known as a distributor which, as its name implies, is used to distribute to the four spark plugs the secondary current from the single coil and for this reason it is placed between the coil and the plugs. The secondary wire, which would ordinarily in a single cylinder engine be connected from the coil to the plug, is in this case connected to the distributor main terminal, while from the four terminals wires are run to the separate plugs. This distributor simply consists of an insulated stationary ring in which are imbedded 4, 6 or 8, according to the number of cylinders in the engine, metal pieces with wires connecting them to the plugs. The secondary wire from the coil carries current to an arm at the center which is rotated so that it comes opposite each of these metallic pieces just as the timer makes its contact and the secondary current is generated which allows it to jump to the nearest contact, across the very small gap. So, instead of having four coils, one coil is worked four times as much, the distributor passing the current to the proper plug. The other parts of the circuit remain just as before.

#### CHANGING THE TIME OF THE SPARK.

As the exact time at which the spark takes place in the engine is important, the timer is so arranged that it can be rotated slightly by a small lever on the steering column or above the steering wheel, thus causing contacts to be made earlier or later in reference to the piston position in the cylinders.

In Fig. 6 is shown a method of wiring when a master vibrator is used. This device allows a single vibrator for any number of cylinders and by its use the difficulty of setting four or six vibrators exactly alike is obviated. It can be mounted in any convenient place on the dash or on the regular coil box. The timer wires and the secondary wires to the spark plugs are not in any way altered but a wire is carried from the battery to the master vibrator at the terminal B and from the central terminal C the vibrator is



Fig. 7

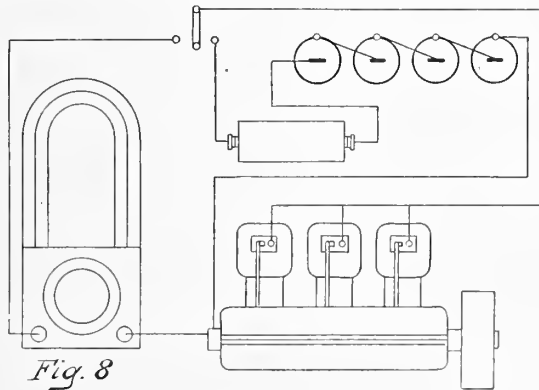


Fig. 8

connected to battery terminal of the coil. The magneto, or other source of ignition, if any, is connected to the other master vibrator terminal. When a master vibrator is used it takes precedence over the vibrators of the coil and the coil vibrator can be short circuited or shunted, as shown by A in the diagram, which completely cuts them out of use.

#### THE MAKE AND BREAK SYSTEM.

Another general system for producing an electric spark for igniting the charge in the gasoline engine is known as the make and break system which uses low tension current only and a mechanical make and break device. This system is sometimes preferred as it does away with all the short circuiting difficulties.

Any source of low tension current can be used the current being passed through what is known as a reactance coil, which has no secondary windings but to a certain degree steps up the voltage. It is, however, not in any sense an induction coil. A magneto with a commutator is usually used. This reactance coil has a single winding low resistance copper wire and an iron core. The length of the core and the number of turns of the insulated winding determines the efficiency. The current passing through the insulated winding magnetizes the iron core, the field of which helps to produce a self-induced current which is superposed on the battery current. When the break in the circuit takes place, the magnetic reactance helps the flow of the current and causes a very hot, reddish yellow spark at the breaking points, the color of the spark depending somewhat on the material of the points. Too long a coil and core cannot be used for high speed work as too great a magnetic lag is set up.

In Fig. 7 a typical primary or make and break apparatus is shown in which the contact points are suddenly separated there being another method employed by which one contact rotates and wipes against the other forming what is called a wipe-spark but other than this the principle is the same. A plug is inserted in the cylinder and carries the stationary member A or "anvil" and the removable rocker arm B known as the "hammer." The actual points which come in contact are usually made of some alloy such as platinum or platinum iridium which will resist being burned away. The external rod C is lifted by an ordinary cam on a cam shaft of the engine against the action of a coiled spring. This rod in its upward movement engages the outer end of the bell crank B the inner end of which is the hammer bringing the points in contact inside of the cylinder, but just the instant after contact has been made the rod C drops off this cam with a quick action due to the heavy spring which has been compressed, rapidly separating the points inside the cylinder thus breaking the circuit and producing a spark. Various methods are used for changing the time of the ignition, such as using a helical cam on the shaft which can be slid lengthwise in its bearings thus changing the time at which the rod C is lifted and dropped or by slightly swinging the lower end of the rod C to one side so at the other it will be engaged earlier or later by the cam changing the spark time.

#### MAKE AND BREAK WIRING DIAGRAM.

In Fig. 8 is shown the diagram for wiring a 3-cylinder engine, and in exactly the same manner a 1, 2, 4, or 6-cylinder engine can be wired. With what has gone before this diagram should be self-explanatory.

#### PRACTICAL ELECTRICAL UNITS AND STANDARDS

In practical work the resistance and electromotive forces commonly met with are usually so large and capacities so small that to obviate the use of too large numbers or small fractions the following practical units are used:

**Resistance.**—The ohm =  $10^9$  (or 1,000,000,000) absolute units of resistance. The International Ohm, which is equal to one true ohm as nearly as known, is the resistance of a uniform column of mercury 106.3 centimetres long and 14.4521 grammes in mass, at the temperature of melting ice. The megohm is a resistance of one million ohms.

**Current.**—The ampere =  $10^{-1}$  (or one-tenth) absolute units. This unit is practically represented by the unvarying current which, when passed through a solution of silver nitrate in water, deposits silver at the rate of .001118 gramme per second.

**Electromotive Force.**—The volt =  $10^8$  (or 100,000,000) absolute units, and is that E. M. F. which applied to one ohm will produce in it a current of one ampere. The volt is equal to 1000-1434 of the E. M. F. of a Clark standard cell at 15 deg. C.

**Quantity.**—The coulomb =  $10^{-1}$  (or one-tenth) absolute units of quantity; being the quantity of electricity conveyed by one ampere in one second. The ampere-hour is the quantity of electricity conveyed by one ampere in one hour.

**Capacity.**—The farad =  $10^{-9}$  (or one one-thousand-millionth) absolute unit of capacity; and is the capacity of a condenser which is charged to a potential of one volt by one coulomb of electricity. The microfarad is one millionth of a farad, and =  $10^{-12}$  absolute units.

**Work.**—The joule =  $10^7$  absolute units of work (or 10,000,000 ergs) and is represented by the energy expended in one second by one ampere passing through a resistance of one ohm. The watt-hour is the energy expended in one hour when the activity, or power, is one watt. The watt-hour is equal to 3,600 joules. The kilowatt-hour is the energy expended in one hour when the activity is one kilowatt. The kilowatt-hour equals 3,600,000 joules.

**Power.**—The watt =  $10^7$  absolute units of power (or 10,000,000 ergs per second), and is the power of a current of one ampere flowing under a pressure of one volt. This unit of power is equal to one joule per second, and is approximately 1/746 of one horse power, or one horse power is equal to 746 watts. The kilowatt is equal to one thousand watts.

## THE CARE AND MAINTENANCE OF STORAGE BATTERIES

## General Remarks.

Storage batteries embody several separate cells conveniently combined in one packing case. Each cell or single battery consists of a group of positive plates inter-leaved between a group of negative plates. The plates are spaced apart by insulating separators. The elements so made are immersed in electrolyte (pure sulphuric acid diluted with pure water).

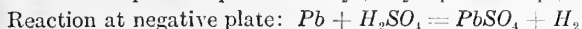
In a charged state the active material on the positive plates is lead peroxide or oxidized lead. The material on the negative plates is porous lead sponge free from oxygen. When the battery discharges, or does work some of the sulphuric acid in the electrolyte chemically unites with the material on the positive plates and negative plates. At the same time that this acid is abstracted, water is formed so that as the discharge continues the strength of the electrolyte grows less, which is shown by the density, measured by hydrometer.

## Discharge Reaction.



After the battery has done its work, charging the battery breaks up the compound formed on each plate, and absorbing water from the electrolyte and restoring sulphuric acid to it ultimately leaves nothing but lead peroxide on the positive and sponge lead on the negative. Nothing whatever is used up except current.

## Reaction at the Plates.



The water in the electrolyte may have evaporated; the sulphuric acid never does. Unless the electrolyte is spilled or comes out as spray it is never necessary to add any sulphuric acid. The quantity originally in the cell does not need to be replenished; it is not used up. On the other hand, as the water contained in the electrolyte evaporates, it is necessary to replenish with distilled water occasionally, so as to keep up the level of the liquid. Any impurities that the water contains are left behind in the cells by the evaporation of the water. Impurities will become concentrated in the cell unless the water used is chemically pure, distilled water. If this is unobtainable, use a good drinking water, free from iron, salt or chlorine.

## Capacity of a Battery.

The capacity of a battery is measured in ampere hours. The volume of current flow is measured in amperes. A current of one ampere flowing for one hour is the unit by which capacity is measured, and is called ampere hour. A fifty (50) ampere hour battery is rated to give one ampere for 50 hours. A sixty (60) ampere hour battery is rated to give one ampere for 60 hours, and a one hundred (100) ampere hour battery is rated to give one ampere for 100 hours.

## How to Get the Greatest Mileage.

The mileage obtainable from a battery depends upon the amount of current consumed by the coil and the capacity or quantity of electricity in the battery; lowering the consumption and increasing the capacity of the battery increases the mileage capacity. The capacity of a battery is independent of its electrical pressure. A 3-cell battery gives six volts, no matter what the size of the cell, but the length of time it will maintain a certain current out of it depends on the capacity or electrical size of a battery.

## Size of Battery.

A one-hundred (100) ampere hour battery will, with one charge, run a car nearly twice as far as a 60 ampere hour battery. The saving in fees for charging is correspondingly reduced. Therefore, unless the battery box is too small, the use of this size battery is recommended as being the best size and yet not too large for convenience or too heavy to handle. Nothing smaller than a fifty (50) ampere hour should be used when only one battery is carried on a car. A very convenient arrangement is to use two batteries, one of which is held in reserve, while the other is running the car. Two 60 ampere hour batteries or one hundred for running and one fifty for reserve, are a good combination. By having two batteries the motorist is assured of ignition current at all times. One battery may be left to be charged while the other is used for running without any inconvenience.

For use in conjunction with a magneto, the fifty (50) hour and 60 ampere hour are convenient adjuncts, always ready in emergency in case the magneto is out of order. By using a battery in conjunction with a magneto, a car may be started from the seat without cranking.

**STORAGE BATTERIES\*****IMPORTANCE OF CLEANLINESS.**

The first necessity is cleanliness. There is nothing that more easily provides a short circuit and causes a leakage of the current than accumulation of dust and many other kindred types of matter. When such are permitted to remain on the top of the cells they become saturated with the moisture which inadvertently sprays from the cell or cells while charging, and thus form an excellent bypass from positive to negative terminals, and in a very short time entirely empty the battery.

Again, this moisture is permitted to attack the terminals of the battery, and these being generally made of brass or similar metal are easily attacked and corroded so that they are immovable and sometimes entirely enveloped by a heavy coating of blue crystals of sulphate of copper. This salt is readily soluble in water and acids, and if allowed to get into the electrolyte of the battery is fatal to the life of the same. Yet how often is this salt washed off with water, or removed by other methods, and allowed to fall into the cells? It is well to keep the terminals coated with vaseline or thick grease and so prevent corrosion. While the growth of the sulphate does commence to form at once when the electrolyte comes in contact with the terminals, its screws or nuts, it does not grow, or accumulate, in one day, or even in several days, to an alarming extent, but usually takes weeks to develop. Just a few minutes, once a week, will suffice to clean up a battery, and so comply with the first and most necessary rule.

Always keep the plates covered with their electrolyte, or acid, because if they are exposed or out of the liquid a sulphation occurs of such a nature as to damage the plates irreparably, besides which that exposed surface is inactive and useless.

Never add sulphuric acid to the cells to compensate loss, unless such loss has been caused by a spilling of the acid, and then first ascertain the specific gravity of the acid remaining in the cells and make up with diluted acid of the corresponding specific gravity till the plates are again covered. In all cases of adding to, or compensating evaporation losses (except as above stated) nothing should be used but pure, distilled water, and absolutely pure and clean acid. A healthy battery used continuously should not require any addition of acid more than once a year, but will probably require pure water at least once a week, if not more often.

**HYDROMETER TESTS.**

Provide yourself with a hydrometer to enable you to test your electrolyte and acids periodically, and you will avoid a great deal of trouble.

It may be said that the condition of the specific gravity is the pulse of the cell, and certainly it is the one means of ascertaining the condition of health of the cell or battery.

Let us suppose that the specific gravity of the electrolyte as given by the maker of the battery is to be maintained at 1.250 degrees, at a temperature of sixty degrees Fahrenheit, when fully charged and cell in thorough working condition. They apply the following:

At the end of the complete discharge the specific gravity will read somewhere about 1.150 degrees. If only half discharged, then about 1.200 degrees. If only one-quarter, 1.225 degrees, or three-quarters, 1.175 degrees, so that one may arrange a scale whereby the amount of charge used, or that remaining in the cells, may be estimated.

**STORAGE BATTERY SHORT CIRCUITS.**

On recharging, the specific gravity will rise from its reading of 1.150, or whatever it may be, to that of 1.250 again, thereby indicating the cell has received its full charge. In cases where the specific gravity will not show any rise during or at the end of its charge, it indicates a short circuit, and the cell has not received its charge.

In cases where the specific gravity comes up to 1.250 at the end of its charge, but falls to a lower figure during a period of idleness or standing for say twenty-four to forty-eight hours, this also indicates a short circuit, or else local action (or internal discharge), due to contamination of the electrolyte by some impurity. Thus, we see that the hydrometer is really an essential equipment for all owners of batteries, and its small cost will well repay for itself.

Never, on any account, discharge your battery below 1.8 volts per cell, because it develops a condition of chemical natures that is not easily remedied. To ascertain this it is necessary to have a small pocket voltmeter reading from say 0-3 volts. These are also very inexpensive and will, if used, greatly prolong the life of your battery by helping you to know when the battery has fulfilled its functions. It is the greatest defect that a battery has, that it cannot give warning, groan, or in some way protest against being over-worked, like most other appliances, but it is so meek, modest and humble that it continues to do its best for its owner until it utterly collapses with fatigue, and like the old proverb, it usually becomes a good horse worked to death.

\*From a report of the Technical Committee of the Long Island Automobile Club.

## VOLTAGE TESTS.

The normal voltage of the storage battery is 2.0 per cell when doing no work, which is, if the electrolyte be 1.250 gravity, usually raised to about 2.10 volts. The storage battery, unless worked below 1.80 volts has a recuperative power of raising from 1.80 volt to the normal 2.0 to 2.10 volts within a few minutes after the discharge current has been discontinued. This act has often led many users astray as to their opinion of the condition of their cells. For instance, suppose one to be out with his car, and the spark is not sufficiently strong to give satisfactory ignition of the gases; he stops to locate the defect. Usually the first thought is, are the batteries right? The voltmeter is taken and put to the cells and because they read 2.0 to 2.10 they are deemed all good. Whereas, if the reading had been taken with a small current passing, the voltmeter would probably have read 1.5 volt, or perhaps less per cell. In this way it often occurs that much time has been lost in going over the car looking for the defect while all the time it has been the batteries which have innocently showed 2.0 volts because they were standing idle. Unless a current is passing, say one-half to one ampere, the voltmeter reading is useless.

## WARNINGS.

Never adopt the method of putting a wire across the positive and negative terminals to see if there is any "spark." It is almost a dead short circuit, and if the cell be of a small capacity of say thirty ampere hour, and the wire No. 16 copper, the current may be anything from thirty to one hundred amperes for a fraction of time, which when calculated is a very appreciable amount of the total capacity, if only for a second of time duration. It is also very detrimental to the cell in assisting the disintegration of the plates or active material thereon.

Never allow the cells to stand in a discharged condition, as it becomes very difficult to get them properly charged if left standing any length of time, unless great care is taken during the succeeding charge.

Do not forget that the discharge current is capable of adjustment by the vibrator of the sparking coil. The current rate of the discharge should be about one-half an ampere, but a badly adjusted coil may take as much as three or even more amperes, thus eating up the energy of the cells, in ampere hours, in one-sixth of the time. Thus a thirty ampere hour cell discharging at one-half an ampere will last sixty hours, but discharging at three amperes will only last about eight or nine hours.

Although, as before stated, the storage battery is a more or less delicate apparatus, yet if only one-tenth of the attention given to the mechanical parts of the car be bestowed on the battery, it will be found to be a wonderfully robust and reliable apparatus. But if neglected entirely and left to attend to itself, or do the best it can for itself, it will be found to arrive very soon at a condition of disease generated by a congestion of small ailments that defy even expert remedies.

Always adhere strictly to the maker's instructions which will apply to his type of cells.

## CHARGING STORAGE BATTERIES.

The storage battery should never be allowed to stand for any length of time uncharged. Remove the vent cap occasionally and make sure the electrolyte or solution comes at least  $\frac{1}{4}$  in. above the tops of the plates. If lower, distilled water should be added in sufficient amount. The electrolyte should show a hydrometer test of 1.275 or 1.250 when the battery is fully charged and 1.150 when the battery is discharged. Before putting new solution into the battery charge it at the usual rate or not exceeding five amperes per hour until it gases freely. Then empty out the old electrolyte and add the new solution until it reaches the proper height.

Electrolyte can be made by adding chemically pure sulphuric acid to distilled water (pour the acid into the water) using 6 oz. of acid to  $8\frac{1}{2}$  oz. of water by weight. The battery should never be allowed to fully run down as it is detrimental.

## POINTS TO BE OBSERVED IN CHARGING.

Connect the positive terminal of the charging line to the positive terminal of the battery which is marked and the negative to the negative terminal. In lieu of any other device the positive wire of the charging line may be found by holding the bare ends of the charging wires about 1 inch apart in a glass of water to which a small amount of salt or a little sulphuric acid has been added. Do not allow the wires to touch. The wire at which the greatest number of bubbles arise is the negative one.

One 32 c.p. 110 volt lamp lets through 1 ampere of current.

Six 32 c.p. 110 volt lamps will let through 6 amperes of current.

A 100 candle power lamp on a 110 volt circuit will allow about three amperes of current to flow.

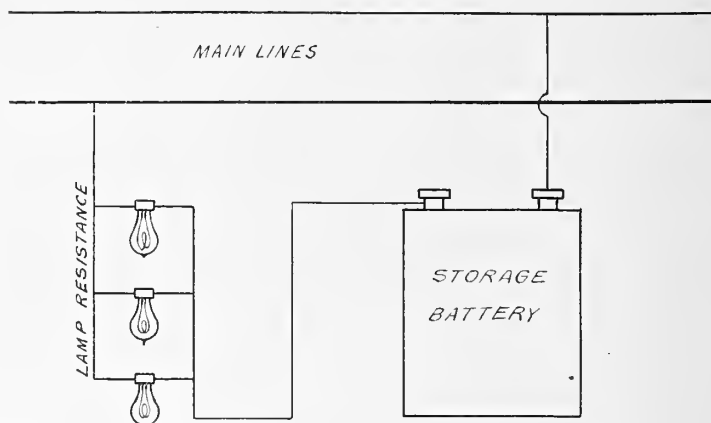


Diagram showing connections for charging battery from generator mains.

When the battery is being charged as it approaches full charge it will begin to gas freely. The charging should usually be continued one hour after this. When fully charged with the current still on the voltage from the cell will be about  $2\frac{1}{2}$ . Voltage readings should always be taken when charging or discharging. After use the cell should be recharged when the voltage drops as low as 1.8-10. However, there are objections to using instruments on a storage battery; in fact, there is no real way of telling exactly how much is in a storage battery as it retains its voltage practically the same almost until the end of the discharge and then drops off rapidly. If allowed to stand for a while after being completely discharged it will often recuperate enough to show a good voltage although there is practically no current back of it. The ammeter produces a dead short circuit and shows what the battery will deliver on a short circuit but it is injurious and the ammeter should be used sparingly. The specific gravity test is the only safe way.

#### CHARGING STORAGE BATTERIES WITH A RHEOSTAT

When charging storage batteries, the voltage of the battery at the beginning of the charge is much lower than the voltage of the line which supplies the charging current. The number of amperes which will flow through the battery will be equal to the net effective volts divided by the sum of internal resistance of the batteries and the resistance of the rheostat. The net effective volts being the difference between the line volts and the battery volts.

The internal resistance of modern batteries is very low, so that if the only resistance in the circuit were the resistance of the batteries, a tremendous current would flow resulting in injury to the battery.

To take a concrete example: Suppose we were to charge 24 cells from a 110 volt circuit, and these cells were of such a type as to require about 20 amperes charging current as a maximum. Our 24 cells would have, say, 48 volts to counteract 110 volts in the line, so that there would be a net effective voltage of 110 less 48, or 62. The resistance of the average 24 cell battery, whose charging rate is 20 amperes, would probably be less than 0.2 ohm, and as the amperes flowing is equal to the net effective voltage divided by the resistance, we would have 62 divided by 0.2, or over 310 amperes of current, which would of course badly injure the batteries.

On account of this low resistance of the batteries, a rheostat is inserted in series with the batteries to reduce the amperes flowing. Thus, if we consider the above mentioned case, where we have 62 effective volts and we want about 20 amperes, we will put almost 2.9 ohms in the rheostat, so that the 62 volts cannot force through the 2.9 ohms plus the 0.2 ohm of the battery more than the 20 amperes maximum required.

There are several types of rheostats made for battery charging. One type, often called the dial type, consists of a slate front having a resistance on the back connected to contacts on the front, and a lever sliding over and making contact with these contacts. Circuit breakers and similar devices are used to break the circuit when through careless operation an overload occurs.

Another type is known as the multiple switch type. Such a rheostat has several knife switches, which are so connected that upon closing one only of these switches a certain number of amperes will flow, and there will be a certain charging rate. Each switch is marked with the charging rate when it alone is closed. If two switches or more are closed the charging rate will be equal to the sum of the rates of the various switches.



In charging from alternating current source a rheostat alone is not satisfactory, and it is necessary to have a rectifier or a rotary converter, or some similar device, in order to convert the electricity from alternating current energy to direct current energy. Very often a rheostat is used in connection with this rectifier or converter after the current has been changed to direct current.

In considering the use of a rheostat in connection with the charging of a storage battery, there are several points which it is desirable that the manufacturer of the rheostat should know:

First. The voltage of the line circuit which will do the charging.

Second. The number of cells of storage battery to be charged in series.

Third. Either the manufacturers' name and type of the cells used, or the maximum and minimum charging rates.

### PRECAUTIONS IN CONNECTION WITH ELECTRICAL DEVICES

See that the wires are heavy enough to carry the current and that all the connections are kept clean and bright as every corroded joint causes needless resistance.

Inspect battery connections, etc., occasionally as they have a habit of working loose.

Look well to the ground connection which should be very securely made and placed where it will not corrode.

Be sure your battery, especially if dry cells are used, is where it cannot get wet as the paste-board may absorb sufficient moisture to short circuit the cells.

See that your wires are securely fastened so that they cannot by any means rub or chafe against either wood or metal parts; especially the secondary wires.

Frequently examine the condition of the plugs as plug-trouble is often looked for elsewhere.

### ELECTRICAL DON'TS

Don't allow your wires to become water or oil soaked as short circuiting will probably result.

Don't screw down electrical connections with the fingers as a tight joint cannot be made. Use pliers.

Don't allow your storage battery to get so far discharged that it will not operate the coil. See that the vibrators are set as lightly as possible to run the engine without skipping, otherwise they will waste current.

Don't take it for granted you have ignition trouble every time the engine stops.

Don't start out knowing your battery to be nearly exhausted as it may run all right to start with but will probably go out of business at a most inopportune time and place.

Don't adjust your coil for the biggest possible spark as it wastes current.

Don't think the coil is no good if the vibrators do not buzz exactly alike.

Don't test storage batteries unless they are charging or discharging.

Don't strain the coil by disconnecting the secondary wires completely so that no spark can jump, or by testing how far it will jump.

Don't screw or nail anything on to the coil box as you may injure it.

Don't tolerate any loose wires or poorly made connections. Fix them at once.

Don't do everything that Tom, Dick and Harry suggest. Know how yourself or if you must have advice go to some one competent to give it.

## Lubricants

### ACTION OF LUBRICATING OIL\*

Oil used as a lubricant forms a film between the rubbing surfaces of greater or lesser thickness, depending upon the pressure transmitted by the surfaces, and upon the viscosity of the oil. When the lubrication is perfect the film is always of sufficient thickness to prevent actual metallic contact between the rubbing surfaces. The oil not only fills the microscopic cavities or pores of the metal, but it yields itself to rougher inequalities in such a manner that high spots on the journal are prevented from coming in contact with the bearing, and low spots are sustained without a perceptible change in the position of the journal. Oil does not permanently identify itself either with the journal or bearing, but sustains the relation of an intermediate film, portions of which are in constant motion. Particles constituting those portions of the film which are most nearly in contact with the box remain most nearly at rest, while particles constituting those portions which are most thoroughly in contact with the journal, tend to take the motion of the journal. Between the two surfaces of the film are particles whose velocities vary between the limits of rest and a velocity represented by the motion of the journal. Thus it is that when rubbing surfaces are oil-lubricated, there is a constant

\*Extracts from results of tests on Joseph Dixon Crucible Company's graphite by Prof. W. F. M. Goss, of Purdue University.

movement of the particles of oil upon one another, and over the metallic surfaces lubricated. The ease with which this movement of the oil itself occurs determines the frictional resistance of the metallic surfaces. The use of a heavy, viscous oil which flows with difficulty, is always accompanied by a high coefficient of friction, whereas the use of a limpid oil is attended by a low coefficient of friction. The fact in this connection which is to be emphasized is that the oil does its work by the movement of its particles one upon another; that rubbing surfaces, when oil-lubricated, apparently float upon a film of oil which yields to the inequalities of their surface and portions of which partake more or less thoroughly of their motion. For best results there must be a constant renewal of the supply of oil, and a corresponding waste from between the rubbing surfaces.

#### Action of Graphite Contrasted with Oil.

In many of these respects, graphite is unlike oil. It does not to any great extent form an intervening film between the rubbing surfaces, but it associates itself with one or the other, or with both of the surfaces in question. It enters every crack and pit which appear in the rubbing surfaces and fills them. If the surfaces themselves are ill-shaped or irregularly worn, the graphite fills in and overlays until a new surface of more regular outline is produced. Thus it is that when graphite is applied to a well-fitted journal and its box, the rubbing surfaces are coated with a graphite layer, so thin as to appear hardly more than a slight discoloration, and the brighter the original finish of the metal surfaces, the thinner will be the layer of graphite. If, on the other hand, the parts are poorly surfaced, or poorly fitted, a veneering of graphite of varying thickness, which in the case of a certain experiment was found as great as 1-16 of an inch, will result. Whether thick or thin, the character of the graphite veneer is always the same; dense in structure; capable of resisting enormous pressure; continuous in surface without apparent pore or crack; and presenting a superficial finish which is wonderfully smooth and delicate to the touch. They present themselves in a most striking manner when graphite is used alone, but they appear in the same form when the graphite applied is intermixed with oils or greases.

#### Tests of Graphite and Sperm Oil as a Lubricant.

It was the purpose of these tests to ascertain the effect of mixing graphite with oil, and if the graphite proved beneficial to find the percentage of graphite which should be intermixed with the oil to give best results.

The coefficient of friction varied with the changes in the amount of graphite used. Best results were obtained when the amount of graphite mixed with oil amounted to 4 per cent. of the weight of the oil. With more or less graphite, the coefficient of friction increased in value. It is noteworthy, also, that with the correct mixture the remarkably low coefficient of less than a quarter of one per cent. is obtained; also, that the addition of graphite seems to improve by a very material amount the lubricating qualities of sperm oil. The reduction effected is from 28 per cent. to 22 per cent. The action of the graphite is evidently to coat with a smooth, hard coating the metal surfaces in contact, and by so doing to relieve the liquid oil from some of the service which it would otherwise have to perform. It seems probable that the percentage of graphite that a lubricant will carry with maximum results will vary with the character of the lubricant itself.

#### Carbon in Oils.

All oils for lubrication should be pure minerals, without any admixtures of animal or vegetable oils. The heavier the oil, the higher the fire test and viscosity test, but also in an oil of this character the darker will be the color which necessarily means a greater amount of carbon. It is therefore advisable to get as light an oil as possible, as color denotes very largely the amount of carbon contained in the oil. Buyers should be cautioned, however, against purchasing oils that have been bleached with acid. Oils that have their color lightened in this manner usually contain traces of acids which are destructive to the metal of the working parts of the engine, and oils of this character contain all of their original carbon.

Free carbon can only be removed from an oil by actual filtration through bone black, fullers earth, etc., thus lightening the oil without deteriorating its lubricating properties.

#### Acid Test.

A very simple test to detect acid in an oil is with Blue Litmus Paper, which will show a pinkish color if there is any acid present. Another sensitive test, and a very practical one, is to partly cover a polished steel plate with a strip of flannel or lamp-

wick saturated with the lubricant to be tested. Expose this to the sunlight for about twenty-four hours. When the plate is wiped dry if the lubricant is free from acid the steel will have retained its gloss. If dull spots have developed on the surface covered it is the sign of the presence of acid.

#### Flash Test.

It is a comparatively simple matter to take a flash test of an oil by heating a small quantity in a porcelain vessel over a Bunsen Flame, stirring the oil with a thermometer and applying a lighted match to the surface of the oil occasionally. When a bluish flame spreads over the liquid and dies out quickly the temperature should be noted, for this is the flash point. From about 410 to 420 degrees Fahr. is a proper flash point.

No cylinder oil should have a flash point lower than 400 degrees Fahrenheit, nor higher than 450 degrees Fahrenheit. The viscosity should not be lower than 200 at 70 degrees Fahrenheit nor higher than 500.

#### Cold Test.

Another point that is of interest, especially in winter time, is to obtain an oil with a proper cold test. It is practically impossible to give a mineral oil a very low cold test; and one that shows from fifteen to twenty degrees below freezing point may be considered all right for the purpose. It is a very small matter to test this by taking a small quantity of the oil in a test tube and surrounding the test tube with cracked ice, over which is sprinkled a handful of salt. The thermometer should then be introduced into the oil and the temperature noted at which it begins to solidify, for this is its cold test. It should be remembered that the darker the oil the poorer the cold test, as the heaviest oils solidify most rapidly.

#### Properties of Light Cylinder Oils.

Color=Pale amber (By Filtration).

Sp. g.=0.87 to 0.90.

Viscosity=210 to 230 at 70 deg. F.

Flash Point=410 to 420 deg. F.

Cold Test=15 to 20 deg. below zero F.

## Anti-Freezing Solutions

### FOR COOLING SYSTEM

There are three principal agents used as the basis for anti-freezing solutions in the cooling systems of water-cooled automobile engines—calcium chloride, glycerine and alcohol. The alcohol solution is usually preferred, especially since the tariff has been removed on denatured alcohol, because it does not damage the metal of the water jacks, radiator or connections, and has no fault except that it evaporates. The other solutions each have advantages, and users may consult their own preferences as to which agency they prefer.

Calcium Chloride ( $\text{CaCl}_2$ ) is a very effective cooling agent but unless the chemically pure article is used there is danger of corrosion of the metal with which it comes in contact. A solution of 5 lbs. of calcium chloride to each gallon of water will not freeze at any temperature above 35 degrees below zero. A more convenient way to prepare the solution is to first make a "saturated solution" of the calcium chloride and water, that is mix with a quantity of water warmed to 60 degrees F. all the calcium chloride the water will completely dissolve, and use equal parts of this saturated solution and pure water in the cooling system of the motor. If chemically pure calcium chloride is used no trouble will result. Chloride of lime ( $\text{CaOCl}_2$ ) should be avoided.

Crude calcium chloride retails at about 8c. or 10c. a pound, while the chemically pure article is worth about 25c. in small quantities.

Glycerine is an effective cooling agent and as it will not crystalize in the water jacket it is preferable in this respect to calcium chloride and it has the further merit of not requiring any renewal during the season as it does not evaporate. It is therefore only necessary to add pure water to replace that which has evaporated. The main fault ascribed to glycerine is its tendency to soften hose connections. Equal parts of glycerine and water are used.

In using a glycerine solution care should be taken to thoroughly cleanse the jackets of any residue of crystals from calcium solutions previously used as this residue will thicken and cloud the glycerine solution.

Alcohol can be used in either small or large quantities. The freezing point of various Ethyl alcohol mixtures taken from "Physikalisch-Chemische Tabellen" are as follows:

## Freezing Points of Ethyl Alcohol Solutions

Percentage of Alcohol in Water	Freezing Temperature Degrees F.
2.418	30.264
5.014	28.418
8.105	26.213
17.96	1° 52'
36.43	3.20
51.06	10.48
86.22	29.02

In addition to these straight mixtures of water and one anti-freezing element there are several combinations of three or more elements such as 1-5 alcohol, 1-5 glycerine and 3-5 water; 4 parts water, 3 parts carbonate potash and 2 parts glycerine, etc.

A saturated solution of common salt can also be used. It does not affect the metal of the system and remains fluid down to 0° F. An incrustation, however, occurs as the water evaporates. Water must be added to make up for evaporation when glycerine, calcium chloride or salt are used.

### Anti-Freezing Solution for Acetylene Generators

It sometimes happens that the water in acetylene generators and piping freezes. Calcium chloride in the water cannot be recommended, as in its usual form it contains acid, which has an action and chokes up the gas passages. Denatured alcohol up to as high as 25 per cent. may be used without affecting the lights. There is very little loss from evaporation. 15 per cent. alcohol and 10 per cent. glycerine have been used, but alcohol alone is to be preferred. If calcium chloride is used it must be pure. A solution of 20 parts to 80 of water freezes at about 5° F. above zero, but even less can be used as the interior of the generator does not usually get that low.

### USEFUL RULES

Circumference of circle	= diameter x 3.1416
Diameter of circle	= circumference x 0.3183
Area of circle	= square of diameter x 0.7854
Length of arc	= number of degrees x diameter x 0.008727

To find the area of a triangle, multiply the base by one-half the perpendicular height.

To find the area of a trapezoid, add the two parallel sides together and multiply the sum by half the perpendicular distance between them.

To find the area of a regular octagon, multiply the square of the diameter of the inscribed circle by the decimal .828.

To find the area of a regular hexagon, multiply the square of the diameter of the inscribed circle by the decimal .866.

To find the number of gallons in elliptical section racing tanks. (All measurements in inches.) Multiply the product of the long and short dimensions of the end of the tank by the length of the tank, by .0339.

To find the area of engaging surface of a cone clutch multiply half the width of face by the sum of the circumferences of the inner and outer edges.

To find the area of the section of a flat bar, or the area of a rectangle, multiply the width by the thickness.

To find the number of cubic inches in any bar, multiply the area of its section in inches by its length in inches.

Area of tube section = .7854  $d^2$  ( $d^2$ — $d$  = outside dia. and  $d$ , inside diameter. weight in air and submerged in water.

Specific gravity = weight of body W compared with weight of an equal bulk of water.

To find specific gravity. Divide the weight in air by the difference between the

## How to Solder Aluminum

There are various compounds on the market for soldering aluminum, but this operation depends more on the workman than on the solder and unless considerable experience has been had it is probably better to purchase solder than to attempt making it. Zinc can be used but does not form a very strong joint. Tin can also be used, is more nearly the color of aluminum, is stronger than zinc, but is very difficult to work. A small proportion of phosphor tin added to pure tin makes it work more readily and is the basis of most aluminum solder.

The chief difficulty in soldering aluminum is that the heat is dissipated so rapidly that it cools the soldering iron and furthermore aluminum oxidizes instantly upon exposure to the air. This extremely thin film effectually prevents a perfect union being made. If the parts are well heated and melted solder kept hot while the iron is allowed to stand on it, the surface can be scraped beneath the melted solder by the point of the soldering iron, thus preventing to a certain extent the oxidization. In this way the metal can be tinned. When both parts to be brought together are well tinned, the parts can be united with some chance of success, nitrate of silver, resin, or zinc chloride being used as a flux. A soldering tool of nickel gives more satisfactory results than a copper one as the latter alloys with the tin and soon becomes rough.

### Cleaning the Metal

If the surface is of such a shape that it cannot be readily cleaned by scraping, it can be cleaned by dipping it into a solution of nitric acid in three times its bulk of hot water containing about 5 per cent. of commercial hydro-fluoric acid. This causes a slight action on the surface of the metal as shown by bubbles. Rinse the metal after removing from the acid bath and dry in hot sawdust.

### Aluminum Solder

The following formula, in the hands of a competent man, can be used to unite aluminum or aluminoid parts:

Tin—10 parts.  
Cadmium—10 parts.  
Zinc—10 parts.  
Lead—1 part.

The parts to be united must be thoroughly cleansed and allowed to stand two to three hours in a strong solution of Hypo-Sulphate of soda before being operated upon, or cleaned in the acid bath described above.

### COMPOSITION OF ALLOYS

The number of alloy compositions such as bronze, brass and babbitts which are now placed on the market by various companies are almost innumerable, each containing various proportions, and some having special ingredients but nearly all contain practically the same combination as a basis. In almost every case the composition is varied slightly according to the uses to which the part cast from the alloy is to be put.

In general the composition of the most common alloys is as given in the accompanying table:

**TABLE OF COMPOSITION OF COMMON ALLOYS**

	Copper	Tin	Zinc	Lead	Antimony	Bismuth
White Bearing Metal .....	2	86	27	2	1	..
Bronze .....	90	2	5	12	..	..
Bronze for bushings .....	130	16	1	..	..	..
Bearing Bronze (for motors) .....	110	13	1	..	..	..
Phosphor Bronze (for gears) .....	90	10*	..	..	..	..
Bronze for flanges, etc., to be brazed.....	32	..	1	1	..	..
Babbitt metal .....	2	50	..	..	4	..
Brass for light parts .....	2	..	1	..	..	..

\*Phosphor Tin

# Mathematical Tables

## SQUARES, SQUARE ROOTS AND CUBE ROOTS OF NUMBERS FROM 1 TO 500

No.	Square	Square Root	Cube Root	No.	Square	Square Root	Cube Root	No.	Square	Square Root	Cube Root
1.	1.	1.	1.	8.5	72.25	2.915	2.041	80.	6400.	8.9443	4.3089
1.05	1.1025	1.025	1.016	8.6	73.96	2.933	2.049	81.	6561.	9.	4.3267
1.1	1.21	1.049	1.032	8.7	75.69	2.950	2.057	82.	6724.	9.0554	4.3445
1.15	1.3225	1.072	1.048	8.8	77.44	2.966	2.065	83.	6889.	9.1104	4.3621
1.2	1.44	1.095	1.063	8.9	79.21	2.983	2.072	84.	7056.	9.1652	4.3795
1.25	1.5625	1.118	1.077	9.	81.	3.	2.0801	85.	7225.	9.2195	4.3968
1.3	1.69	1.140	1.091	9.1	82.81	3.017	2.088	86.	7396.	9.2736	4.4140
1.35	1.8225	1.162	1.105	9.2	84.64	3.033	2.095	87.	7569.	9.3276	4.4310
1.4	1.96	1.183	1.119	9.3	86.49	3.050	2.103	88.	7744.	9.3808	4.4480
1.45	2.1025	1.204	1.132	9.4	88.36	3.066	2.110	89.	7921.	9.4340	4.4647
1.5	2.25	1.2247	1.1447	9.5	90.25	3.082	2.118	90.	8100.	9.4868	4.4814
1.55	2.4025	1.245	1.157	9.6	92.16	3.098	2.125	91.	8281.	9.5394	4.4979
1.6	2.56	1.265	1.170	9.7	94.09	3.114	2.133	92.	8464.	9.5917	4.5144
1.65	2.7225	1.285	1.182	9.8	96.04	3.130	2.140	93.	8649.	9.6437	4.5307
1.7	2.89	1.304	1.193	9.9	98.01	3.146	2.147	94.	8836.	9.6954	4.5468
1.75	3.0625	1.323	1.205	10.	100.	3.1623	2.1544	95.	9025.	9.7468	4.5629
1.8	3.24	1.342	1.216	11.	121.	3.3166	2.2240	96.	9216.	9.7980	4.5789
1.85	3.4225	1.360	1.228	12.	144.	3.4641	2.2894	97.	9409.	9.8489	4.5947
1.9	3.61	1.378	1.239	13.	169.	3.6056	2.3513	98.	9604.	9.8995	4.6104
1.95	3.8025	1.396	1.249	14.	196.	3.7417	2.4101	99.	9801.	9.9499	4.6261
2.	4.	1.4142	1.2599	15.	225.	3.8730	2.4662	100.	10000.	10.	4.6416
2.1	4.41	1.449	1.281	16.	256.	4.	2.5198	101.	10201.	10.0499	4.6570
2.2	4.84	1.483	1.301	17.	289.	4.1231	2.5713	102.	10404.	10.0995	4.6723
2.3	5.29	1.517	1.320	18.	324.	4.2426	2.6207	103.	10609.	10.1489	4.6875
2.4	5.76	1.549	1.339	19.	361.	4.3589	2.6684	104.	10816.	10.1980	4.7027
2.5	6.25	1.581	1.357	20.	400.	4.4721	2.7144	105.	11025.	10.2470	4.7177
2.6	6.76	1.612	1.375	21.	441.	4.5826	2.7589	106.	11236.	10.2956	4.7326
2.7	7.29	1.643	1.392	22.	484.	4.6904	2.8020	107.	11449.	10.3441	4.7475
2.8	7.84	1.673	1.409	23.	529.	4.7958	2.8439	108.	11664.	10.3923	4.7622
2.9	8.41	1.703	1.426	24.	576.	4.8990	2.8845	109.	11881.	10.4403	4.7769
3.	9.	1.7321	1.4422	25.	625.	5.	2.9240	110.	12100.	10.4881	4.7914
3.1	9.61	1.761	1.458	26.	676.	5.0990	2.9625	111.	12321.	10.5357	4.8059
3.2	10.24	1.789	1.474	27.	729.	5.1962	3.	112.	12544.	10.5830	4.8203
3.3	10.89	1.817	1.489	28.	784.	5.2915	3.0366	113.	12769.	10.6301	4.8346
3.4	11.56	1.844	1.504	29.	841.	5.3852	3.0723	114.	12996.	10.6771	4.8488
3.5	12.25	1.871	1.518	30.	900.	5.4772	3.1072	115.	13225.	10.7238	4.8629
3.6	12.96	1.897	1.533	31.	961.	5.5678	3.1414	116.	13456.	10.7703	4.8770
3.7	13.69	1.924	1.547	32.	1024.	5.6569	3.1748	117.	13689.	10.8167	4.8910
3.8	14.44	1.949	1.560	33.	1089.	5.7446	3.2075	118.	13924.	10.8628	4.9049
3.9	15.21	1.975	1.574	34.	1156.	5.8310	3.2396	119.	14161.	10.9087	4.9187
4.	16.	2.	1.5874	35.	1225.	5.9161	3.2711	120.	14400.	10.9545	4.9324
4.1	16.81	2.025	1.601	36.	1296.	6.	3.3019	121.	14641.	11.0000	4.9461
4.2	17.64	2.049	1.613	37.	1369.	6.0828	3.3322	122.	14884.	11.0454	4.9597
4.3	18.49	2.074	1.626	38.	1444.	6.1644	3.3620	123.	15129.	11.0905	4.9732
4.4	19.36	2.098	1.639	39.	1521.	6.2450	3.3912	124.	15376.	11.1355	4.9866
4.5	20.25	2.121	1.651	40.	1600.	6.3246	3.4200	125.	15625.	11.1803	5.0000
4.6	21.16	2.145	1.663	41.	1681.	6.4031	3.4482	126.	15876.	11.2250	5.0133
4.7	22.09	2.168	1.675	42.	1764.	6.4807	3.4760	127.	16129.	11.2694	5.0265
4.8	23.04	2.191	1.687	43.	1849.	6.5574	3.5034	128.	16384.	11.3137	5.0397
4.9	24.01	2.214	1.698	44.	1936.	6.6332	3.5303	129.	16641.	11.3578	5.0528
5.	25.	2.2361	1.7100	45.	2025.	6.7082	3.5569	130.	16900.	11.4018	5.0658
5.1	26.01	2.258	1.721	46.	2116.	6.7823	3.5830	131.	17161.	11.4455	5.0788
5.2	27.04	2.280	1.732	47.	2209.	6.8557	3.6088	132.	17424.	11.4891	5.0916
5.3	28.09	2.302	1.744	48.	2304.	6.9282	3.6342	133.	17689.	11.5326	5.1045
5.4	29.16	2.324	1.754	49.	2401.	7.	3.6593	134.	17956.	11.5758	5.1172
5.5	30.25	2.345	1.765	50.	2500.	7.0711	3.6840	135.	18225.	11.6190	5.1299
5.6	31.36	2.366	1.776	51.	2601.	7.1414	3.7084	136.	18496.	11.6619	5.1426
5.7	32.49	2.387	1.786	52.	2704.	7.2111	3.7325	137.	18769.	11.7047	5.1551
5.8	33.64	2.408	1.797	53.	2809.	7.2801	3.7563	138.	19044.	11.7473	5.1676
5.9	34.81	2.429	1.807	54.	2916.	7.3485	3.7798	139.	19321.	11.7898	5.1801
6.	36.	2.4495	1.8171	55.	3025.	7.4162	3.8030	140.	19600.	11.8322	5.1925
6.1	37.21	2.470	1.827	56.	3136.	7.4833	3.8259	141.	19881.	11.8743	5.2048
6.2	38.44	2.490	1.837	57.	3249.	7.5498	3.8485	142.	20164.	11.9164	5.2171
6.3	39.69	2.510	1.847	58.	3364.	7.6158	3.8709	143.	20449.	11.9583	5.2293
6.4	40.96	2.530	1.857	59.	3481.	7.6811	3.8930	144.	20736.	12.0000	5.2415
6.5	42.25	2.550	1.866	60.	3600.	7.7460	3.9149	145.	21025.	12.0416	5.2536
6.6	43.56	2.569	1.876	61.	3721.	7.8102	3.9365	146.	21316.	12.0830	5.2656
6.7	44.89	2.588	1.885	62.	3844.	7.8740	3.9579	147.	21609.	12.1244	5.2776
6.8	46.24	2.608	1.895	63.	3969.	7.9373	3.9791	148.	21904.	12.1655	5.2896
6.9	47.61	2.627	1.904	64.	4096.	8.	4.	149.	22201.	12.2066	5.3015
7.	49.	2.6458	1.9129	65.	4225.	8.0623	4.0207	150.	22500.	12.2474	5.3133
7.1	50.41	2.665	1.922	66.	4356.	8.1240	4.0412	151.	22801.	12.2882	5.3251
7.2	51.84	2.683	1.931	67.	4489.	8.1854	4.0615	152.	23104.	12.3288	5.3368
7.3	53.29	2.702	1.940	68.	4624.	8.2462	4.0817	153.	23409.	12.3693	5.3485
7.4	54.76	2.720	1.949	69.	4761.	8.3066	4.1016	154.	23716.	12.4097	5.3601
7.5	56.25	2.739	1.957	70.	4900.	8.3666	4.1213	155.	24025.	12.4499	5.3717
7.6	57.76	2.757	1.966	71.	5041.	8.4261	4.1408	156.	24336.	12.4900	5.3822
7.7	59.29	2.775	1.975	72.	5184.	8.4853	4.1602	157.	24649.	12.5300	5.3947
7.8	60.84	2.793	1.983	73.	5329.	8.5440	4.1793	158.	24964.	12.5698	5.4061
7.9	62.41	2.811	1.992	74.	5476.	8.6023	4.1983	159.	25281.	12.6095	5.4175
8.	64.	2.8284	2.	75.	5625.	8.6603	4.2172	160.	25600.	12.6491	5.4288
8.1	65.61	2.846	2.008	76.	5776.	8.7178	4.2358	161.	25921.	12.6886	5.4401
8.2	67.24	2.864	2.017	77.	5929.	8.7750	4.2543	162.	26244.	12.7279	5.4514
8.3	68.89	2.881	2.025	78.	6084.	8.8318	4.2727	163.	26569.	12.7671	5.4626
8.4	70.56	2.898	2.033	79.	6241.	8.8882	4.2908				

No	Square	Square Root	Cube Root	No.	Square	Square Root	Cube Root	No.	Square	Square Root	Cube Root
164.	26896.	12.8062	5.4737	254.	64516.	15.9374	6.3330	345.	119025.	18.5742	7.0136
165.	27225.	12.8452	5.4848	255.	65025.	15.9687	6.3413	346.	119716.	18.6011	7.0203
166.	27556.	12.8841	5.4959	256.	65536.	16.0000	6.3496	347.	120409.	18.6279	7.0271
167.	27889.	12.9228	5.5069	257.	66049.	16.0312	6.3579	348.	121101.	18.6548	7.0338
168.	28224.	12.9615	5.5178	258.	66564.	16.0624	6.3661	349.	121801.	18.6815	7.0406
169.	28561.	13.0000	5.5288	259.	67081.	16.0935	6.3743	350.	122500.	18.7083	7.0473
170.	28900.	13.0384	5.5397	260.	67600.	16.1245	6.3825	351.	123201.	18.7350	7.0540
171.	29241.	13.0767	5.5505	261.	68121.	16.1555	6.3907	352.	123904.	18.7617	7.0607
172.	29584.	13.1149	5.5613	262.	68644.	16.1864	6.3988	353.	124609.	18.7883	7.0674
173.	29929.	13.1529	5.5721	263.	69169.	16.2173	6.4070	354.	125316.	18.8149	7.0740
174.	30276.	13.1909	5.5828	264.	69696.	16.2481	6.4151	355.	126025.	18.8414	7.0807
175.	30625.	13.2288	5.5934	265.	70225.	16.2788	6.4232	356.	126736.	18.8680	7.0873
176.	30976.	13.2665	5.6041	266.	70756.	16.3095	6.4312	357.	127449.	18.8944	7.0940
177.	31329.	13.3041	5.6147	267.	71289.	16.3401	6.4393	358.	128164.	18.9209	7.1006
178.	31684.	13.3417	5.6252	268.	71824.	16.3707	6.4473	359.	128881.	18.9473	7.1072
179.	32041.	13.3791	5.6357	269.	72361.	16.4012	6.4553	360.	129600.	18.9737	7.1138
180.	32400.	13.4164	5.6462	270.	72900.	16.4317	6.4633	361.	130321.	19.0000	7.1204
181.	32761.	13.4536	5.6567	271.	73441.	16.4621	6.4713	362.	131044.	19.0263	7.1269
182.	33124.	13.4907	5.6671	272.	73984.	16.4924	6.4792	363.	131769.	19.0526	7.1335
183.	33489.	13.5277	5.6774	273.	74529.	16.5227	6.4872	364.	132496.	19.0788	7.1400
184.	33856.	13.5647	5.6877	274.	75076.	16.5529	6.4951	365.	133225.	19.1050	7.1466
185.	34225.	13.6015	5.6980	275.	75625.	16.5831	6.5030	366.	133956.	19.1311	7.1531
186.	34596.	13.6382	5.7083	276.	76176.	16.6132	6.5108	367.	134689.	19.1572	7.1596
187.	34969.	13.6748	5.7185	277.	76729.	16.6433	6.5187	368.	135424.	19.1833	7.1661
188.	35344.	13.7113	5.7287	278.	77284.	16.6733	6.5265	369.	136161.	19.2093	7.1726
189.	35721.	13.7477	5.7388	279.	77841.	16.7033	6.5343	370.	136900.	19.2354	7.1791
190.	36100.	13.7840	5.7489	280.	78400.	16.7332	6.5421	371.	137641.	19.2614	7.1855
191.	36481.	13.8203	5.7590	281.	78961.	16.7631	6.5499	372.	138384.	19.2873	7.1920
192.	36864.	13.8564	5.7690	282.	79524.	16.7929	6.5577	373.	139129.	19.3132	7.1984
193.	37249.	13.8924	5.7790	283.	80089.	16.8226	6.5654	374.	139876.	19.3391	7.2048
194.	37636.	13.9284	5.7890	284.	80656.	16.8523	6.5731	375.	140625.	19.3649	7.2112
195.	38025.	13.9642	5.7989	285.	81225.	16.8819	6.5808	376.	141376.	19.3907	7.2177
196.	38416.	14.0000	5.8088	286.	81796.	16.9115	6.5885	377.	142129.	19.4165	7.2240
197.	38809.	14.0357	5.8186	287.	82369.	16.9411	6.5962	378.	142884.	19.4422	7.2304
198.	39204.	14.0712	5.8285	288.	82944.	16.9706	6.6039	379.	143641.	19.4679	7.2368
199.	39601.	14.1067	5.8383	289.	83521.	17.0000	6.6115	380.	144400.	19.4936	7.2432
200.	40000.	14.1421	5.8480	290.	84100.	17.0294	6.6191	381.	145161.	19.5192	7.2495
201.	40401.	14.1774	5.8578	291.	84681.	17.0587	6.6267	382.	145924.	19.5448	7.2558
202.	40804.	14.2127	5.8675	292.	85264.	17.0880	6.6343	383.	146689.	19.5704	7.2622
203.	41209.	14.2478	5.8771	293.	85849.	17.1172	6.6419	384.	147456.	19.5959	7.2685
204.	41616.	14.2829	5.8868	294.	86436.	17.1464	6.6494	385.	148225.	19.6214	7.2748
205.	42025.	14.3178	5.8964	295.	87025.	17.1756	6.6569	386.	148996.	19.6469	7.2811
206.	42436.	14.3527	5.9059	296.	87616.	17.2047	6.6644	387.	149769.	19.6723	7.2874
207.	42849.	14.3875	5.9155	297.	88209.	17.2337	6.6719	388.	150544.	19.6977	7.2936
208.	43264.	14.4222	5.9250	298.	88804.	17.2627	6.6794	389.	151321.	19.7231	7.2999
209.	43681.	14.4568	5.9345	299.	89401.	17.2916	6.6869	390.	152100.	19.7484	7.3061
210.	44100.	14.4914	5.9439	300.	90000.	17.3205	6.6943	391.	152881.	19.7737	7.3124
211.	44521.	14.5258	5.9533	301.	90601.	17.3494	6.7018	392.	153664.	19.7990	7.3186
212.	44944.	14.5602	5.9627	302.	91204.	17.3781	6.7092	393.	154449.	19.8242	7.3248
213.	45369.	14.5945	5.9721	303.	91809.	17.4069	6.7166	394.	155236.	19.8494	7.3310
214.	45796.	14.6287	5.9814	304.	92416.	17.4356	6.7240	395.	156025.	19.8746	7.3372
215.	46225.	14.6629	5.9907	305.	93025.	17.4642	6.7313	396.	156816.	19.8997	7.3434
216.	46656.	14.6969	6.0000	306.	93636.	17.4929	6.7387	397.	157609.	19.9249	7.3496
217.	47089.	14.7309	6.0092	307.	94249.	17.5214	6.7460	398.	158404.	19.9499	7.3558
218.	47524.	14.7648	6.0185	308.	94864.	17.5499	6.7533	399.	159201.	19.9750	7.3619
219.	47961.	14.7986	6.0277	309.	95481.	17.5784	6.7606	400.	160000.	20.0000	7.3681
220.	48400.	14.8324	6.0368	310.	96100.	17.6068	6.7679	401.	160801.	20.0250	7.3742
221.	48841.	14.8661	6.0459	311.	96721.	17.6352	6.7752	402.	161604.	20.0499	7.3803
222.	49284.	14.8997	6.0550	312.	97344.	17.6635	6.7824	403.	162409.	20.0749	7.3864
223.	49729.	14.9332	6.0641	313.	97969.	17.6918	6.7897	404.	163216.	20.0998	7.3925
224.	50176.	14.9666	6.0732	314.	98596.	17.7200	6.7969	405.	164025.	20.1246	7.3986
225.	50625.	15.0000	6.0822	315.	99225.	17.7482	6.8041	406.	164836.	20.1494	7.4047
226.	51076.	15.0333	6.0912	316.	99856.	17.7764	6.8113	407.	165649.	20.1742	7.4108
227.	51529.	15.0665	6.1002	317.	100489.	17.8045	6.8185	408.	166464.	20.1990	7.4169
228.	51984.	15.0997	6.1091	318.	101124.	17.8326	6.8256	409.	167281.	20.2237	7.4229
229.	52441.	15.1327	6.1180	319.	101761.	17.8606	6.8328	410.	168100.	20.2485	7.4290
230.	52900.	15.1658	6.1269	320.	102400.	17.8885	6.8399	411.	168921.	20.2731	7.4350
231.	53361.	15.1987	6.1358	321.	103041.	17.9165	6.8470	412.	169744.	20.2978	7.4410
232.	53824.	15.2315	6.1446	322.	103684.	17.9444	6.8541	413.	170569.	20.3224	7.4470
233.	54289.	15.2643	6.1534	323.	104329.	17.9722	6.8612	414.	171396.	20.3470	7.4530
234.	54756.	15.2971	6.1622	324.	104976.	18.0000	6.8683	415.	172225.	20.3715	7.4590
235.	55225.	15.3297	6.1710	325.	105625.	18.0278	6.8753	416.	173056.	20.3961	7.4650
236.	55696.	15.3623	6.1797	326.	106276.	18.0555	6.8824	417.	173889.	20.4206	7.4710
237.	56169.	15.3948	6.1885	327.	106929.	18.0831	6.8894	418.	174724.	20.4450	7.4770
238.	56644.	15.4272	6.1972	328.	107584.	18.1108	6.8964	419.	175561.	20.4695	7.4829
239.	57121.	15.4596	6.2058	329.	108241.	18.1384	6.9034	420.	176400.	20.4939	7.4889
240.	57600.	15.4919	6.2145	330.	108900.	18.1659	6.9104	421.	177241.	20.5183	7.4948
241.	58081.	15.5242	6.2231	331.	109561.	18.1934	6.9174	422.	178084.	20.5426	7.5007
242.	58564.	15.5563	6.2317	332.	110224.	18.2209	6.9244	423.	178929.	20.5670	7.5067
243.	59049.	15.5885	6.2403	333.	110889.	18.2483	6.9313	424.	179776.	20.5913	7.5126
244.	59536.	15.6205	6.2488	334.	111556.	18.2757	6.9382	425.	180625.	20.6155	7.5185
245.	60025.	15.6525	6.2573	335.	112225.	18.3030	6.9451	426.	181476.	20.6398	7.5244
246.	60516.	15.6844	6.2658	336.	112896.	18.3303	6.9521	427.	182329.	20.6640	7.5302
247.	61009.	15.7162	6.2743	337.	113569.	18.3576	6.9589	428.	183184.	20.6882	7.5361
248.	61504.	15.7480	6.2828	338.	114244.	18.3848	6.9658	429.	184041.	20.7123	7.5420
249.	62001.	15.7797	6.2912	339.	114921.	18.4120	6.9727	430.	184900.	20.7364	7.5478
250.	62500.	15.8114	6.2996	340.	115600.	18.4391	6.9795	431.	185761.	20.7605	7.5537
251.	63001.	15.8430	6.3080	341.	116281.	18.4662	6.9864	432.	186624.	20.7846	7.5595
252.	63504.	15.8745	6.3164	342.	116964.	18.4932	6.9932	433.	187489.	20.8087	7.5654
253.	64009.	15.9060	6.3247	343.	117649.	18.5203	7.0000	434.	188356.	20.8327	7.5712
				344.	118336.	18.5472	7.0068	435.	189225.	20.8567	7.5770



No.	Square	Square Root	Cube Root	No.	Square	Square Root	Cube Root	No.	Square	Square Root	Cube Root
436.	190096.	20.8806	7.5828	457.	208849.	21.3776	7.7026	479.	229441.	21.8861	7.8243
437.	190969.	20.9045	7.5886	458.	209764.	21.4009	7.7082	480.	230400.	21.9089	7.8297
438.	191844.	20.9284	7.5944	459.	210681.	21.4243	7.7138	481.	231361.	21.9317	7.8352
439.	192721.	20.9523	7.6001	460.	211600.	21.4476	7.7194	482.	232324.	21.9545	7.8406
440.	193600.	20.9762	7.6059	461.	212521.	21.4709	7.7250	483.	233289.	21.9773	7.8460
441.	194481.	21.0000	7.6117	462.	213444.	21.4942	7.7306	484.	234256.	22.0000	7.8514
442.	195364.	21.0238	7.6174	463.	214369.	21.5174	7.7362	485.	235225.	22.0227	7.8568
443.	196249.	21.0476	7.6232	464.	215296.	21.5407	7.7418	486.	236196.	22.0454	7.8622
444.	197136.	21.0713	7.6289	465.	216225.	21.5639	7.7473	487.	237169.	22.0681	7.8676
445.	198025.	21.0950	7.6346	466.	217156.	21.5870	7.7529	488.	238144.	22.0907	7.8730
446.	198916.	21.1187	7.6403	467.	218089.	21.6102	7.7584	489.	239121.	22.1133	7.8784
447.	199809.	21.1424	7.6460	468.	219024.	21.6333	7.7639	490.	240100.	22.1359	7.8837
448.	200704.	21.1660	7.6517	469.	219961.	21.6564	7.7695	491.	241081.	22.1585	7.8891
449.	201601.	21.1896	7.6574	470.	220900.	21.6795	7.7750	492.	242064.	22.1811	7.8944
450.	202500.	21.2132	7.6631	471.	221841.	21.7025	7.7805	493.	243049.	22.2036	7.8998
451.	203401.	21.2368	7.6688	472.	222784.	21.7256	7.7860	494.	244036.	22.2261	7.9051
452.	204304.	21.2603	7.6744	473.	223729.	21.7486	7.7915	495.	245025.	22.2486	7.9105
453.	205209.	21.2838	7.6800	474.	224676.	21.7715	7.7970	496.	246016.	22.2711	7.9158
454.	206116.	21.3073	7.6857	475.	225625.	21.7945	7.8025	497.	247009.	22.2935	7.9211
455.	207025.	21.3307	7.6914	476.	226576.	21.8174	7.8079	498.	248004.	22.3159	7.9264
456.	207936.	21.3542	7.6970	477.	227529.	21.8403	7.8134	499.	249001.	22.3383	7.9317
				478.	228484.	21.8632	7.8188	500.	250000.	22.3607	7.9370

## FRACTION OF ONE INCH IN DECIMAL EQUIVALENTS

Advancing by 8th

8ths.	$\frac{9}{16} = .5625$	$\frac{17}{32} = .53125$	$\frac{9}{64} = .140625$	$\frac{37}{64} = .578125$
$\frac{1}{8} = .125$	$\frac{11}{16} = .6875$	$\frac{19}{32} = .59375$	$\frac{11}{64} = .171875$	$\frac{39}{64} = .609375$
$\frac{1}{4} = .25$	$\frac{13}{16} = .8125$	$\frac{21}{32} = .65625$	$\frac{13}{64} = .203125$	$\frac{41}{64} = .640625$
$\frac{3}{8} = .375$	$\frac{15}{16} = .9375$	$\frac{23}{32} = .71875$	$\frac{15}{64} = .234375$	$\frac{43}{64} = .671875$
$\frac{1}{2} = .50$		$\frac{25}{32} = .78125$	$\frac{17}{64} = .265625$	$\frac{45}{64} = .703125$
$\frac{5}{8} = .625$	<b>32nds.</b>	$\frac{27}{32} = .84375$	$\frac{19}{64} = .296875$	$\frac{47}{64} = .734375$
$\frac{3}{4} = .75$	$\frac{1}{32} = .03125$	$\frac{29}{32} = .90625$	$\frac{21}{64} = .328125$	$\frac{49}{64} = .765625$
$\frac{7}{8} = .875$	$\frac{3}{32} = .09375$	$\frac{31}{32} = .96875$	$\frac{23}{64} = .359375$	$\frac{51}{64} = .796875$
	$\frac{5}{32} = .15625$		$\frac{25}{64} = .390625$	$\frac{53}{64} = .828125$
<b>16ths.</b>	$\frac{7}{32} = .21875$	<b>64ths.</b>	$\frac{27}{64} = .421875$	$\frac{55}{64} = .859375$
$\frac{1}{16} = .0625$	$\frac{9}{32} = .28125$	$\frac{1}{64} = .015625$	$\frac{29}{64} = .453125$	$\frac{57}{64} = .890625$
$\frac{3}{16} = .1875$	$\frac{11}{32} = .34375$	$\frac{3}{64} = .046875$	$\frac{31}{64} = .484375$	$\frac{59}{64} = .921875$
$\frac{5}{16} = .3125$	$\frac{13}{32} = .40625$	$\frac{5}{64} = .078125$	$\frac{33}{64} = .515625$	$\frac{61}{64} = .953125$
$\frac{7}{16} = .4375$	$\frac{15}{32} = .46875$	$\frac{7}{64} = .109375$	$\frac{35}{64} = .546875$	$\frac{63}{64} = .984375$

To convert a common fraction into a decimal:—Divide the numerator by the denominator, adding to the numerator as many ciphers prefixed by a decimal point as are necessary to give the number of decimal places desired in the result.

$$\frac{2}{3} = 2.0000 \div 3 = 0.6666 +$$

## DECIMAL EQUIVALENTS OF FRACTION OF ONE INCH

Advancing by 64th

1-64	.015625	17-64	.265625	33-64	.515625	49-64	.765625
1-32	.03125	9-32	.28125	17-32	.53125	25-32	.78125
3-64	.046875	19-64	.296875	35-64	.546875	51-64	.796875
1-16	.0625	5-16	.3125	9-16	.5625	13-16	.8125
5-64	.078125	21-64	.328125	37-64	.578125	53-64	.828125
3-32	.09375	11-32	.34375	19-32	.59375	27-32	.84375
7-64	.109375	23-64	.359375	39-64	.609375	55-64	.859375
1-8	.125	3-8	.375	5-8	.625	7-8	.875
9-64	.140625	25-64	.390625	41-64	.640625	57-64	.890625
5-32	.15625	13-32	.40625	21-32	.65625	29-32	.90625
11-64	.171875	27-64	.421875	43-64	.671875	59-64	.921875
3-16	.1875	7-16	.4375	11-16	.6875	15-16	.9375
13-64	.203125	29-64	.453125	45-64	.703125	61-64	.953125
7-32	.21875	15-32	.46875	23-32	.71875	31-32	.96875
15-64	.234375	31-64	.484375	47-64	.734375	63-64	.984375
1-4	.25	1-2	.50	3-4	.75	1	1.

## CIRCUMFERENCES AND AREAS OF CIRCLES

From 1 inch to 25 inches inclusive

Diam.	Circum.	Area	Diam.	Circum.	Area	Diam.	Circum.	Area
1	3.1416	.7854	4	12.566	12.566	8	25.133	50.265
$1\frac{1}{16}$	3.3379	.8866	$4\frac{1}{16}$	12.763	12.962	$8\frac{1}{16}$	25.525	51.849
$1\frac{1}{8}$	3.5343	.9940	$4\frac{1}{8}$	12.959	13.364	$8\frac{1}{8}$	25.918	53.546
$1\frac{3}{16}$	3.7306	1.1075	$4\frac{3}{16}$	13.155	13.772	$8\frac{3}{16}$	26.311	55.088
$1\frac{1}{4}$	3.9270	1.2272	$4\frac{1}{4}$	13.352	14.186	$8\frac{1}{4}$	26.704	56.745
$1\frac{5}{16}$	4.1233	1.3530	$4\frac{5}{16}$	13.548	14.607	$8\frac{5}{16}$	27.096	58.426
$1\frac{3}{8}$	4.3197	1.4849	$4\frac{3}{8}$	13.744	15.033	$8\frac{3}{8}$	27.489	60.132
$1\frac{1}{2}$	4.5160	1.6230	$4\frac{1}{2}$	13.941	15.466	$8\frac{1}{2}$	27.882	61.862
$1\frac{7}{16}$	4.7124	1.7671	$4\frac{7}{16}$	14.137	15.904			
$1\frac{1}{2}$	4.9087	1.9175	$4\frac{1}{2}$	14.334	16.349	9	28.274	63.617
$1\frac{9}{16}$	5.1051	2.0739	$4\frac{9}{16}$	14.530	16.800	$9\frac{1}{16}$	28.667	65.397
$1\frac{5}{8}$	5.3014	2.2365	$4\frac{5}{8}$	14.726	17.257	$9\frac{1}{8}$	29.060	67.201
$1\frac{3}{4}$	5.4978	2.4053	$4\frac{3}{4}$	14.923	17.728	$9\frac{3}{16}$	29.452	69.029
$1\frac{7}{8}$	5.6941	2.5802	$4\frac{7}{8}$	15.119	18.190	$9\frac{1}{4}$	29.845	70.882
$1\frac{15}{16}$	5.8905	2.7612	$4\frac{15}{16}$	15.315	18.665	$9\frac{5}{16}$	30.238	72.760
	6.0868	2.9483		15.512	19.147	$9\frac{3}{8}$	30.631	74.662
						$9\frac{1}{2}$	31.023	76.589
2	6.2832	3.1416	5	15.708	19.635			
$2\frac{1}{16}$	6.4795	3.3410	$5\frac{1}{16}$	15.904	20.129	10	31.416	78.540
$2\frac{1}{8}$	6.6759	3.5466	$5\frac{1}{8}$	16.101	20.629	$10\frac{1}{16}$	31.809	80.516
$2\frac{3}{16}$	6.8722	3.7583	$5\frac{3}{16}$	16.297	21.135	$10\frac{1}{8}$	32.201	82.516
$2\frac{1}{4}$	7.0686	3.9761	$5\frac{1}{4}$	16.493	21.648	$10\frac{3}{16}$	32.594	84.541
$2\frac{5}{16}$	7.2649	4.2000	$5\frac{5}{16}$	16.690	22.166	$10\frac{1}{4}$	32.987	86.500
$2\frac{3}{8}$	7.4613	4.4301	$5\frac{3}{8}$	16.886	22.691	$10\frac{5}{16}$	33.379	88.664
$2\frac{1}{2}$	7.6576	4.6664	$5\frac{1}{2}$	17.082	23.221	$10\frac{3}{8}$	33.772	90.763
$2\frac{7}{16}$	7.8540	4.9087	$5\frac{7}{16}$	17.279	23.758	$10\frac{1}{2}$	34.165	92.886
$2\frac{1}{2}$	8.0503	5.1572	$5\frac{1}{2}$	17.475	24.301			
$2\frac{9}{16}$	8.2467	5.4119	$5\frac{9}{16}$	17.671	24.850	11	34.558	95.033
$2\frac{5}{8}$	8.4430	5.6727	$5\frac{5}{8}$	17.868	25.406	$11\frac{1}{16}$	34.950	97.205
$2\frac{3}{4}$	8.6394	5.9396	$5\frac{3}{4}$	18.064	25.967	$11\frac{1}{8}$	35.343	99.402
$2\frac{7}{8}$	8.8357	6.2126	$5\frac{7}{8}$	18.261	26.535	$11\frac{3}{16}$	35.736	101.62
$2\frac{15}{16}$	9.0321	6.4918	$5\frac{15}{16}$	18.457	27.109	$11\frac{1}{4}$	36.128	103.87
	9.2284	6.7771		18.653	27.688	$11\frac{5}{16}$	36.521	106.14
						$11\frac{3}{8}$	36.914	108.43
3	9.4248	7.0686	6	18.850	28.274	$11\frac{1}{2}$	37.306	110.75
$3\frac{1}{16}$	9.6211	7.3662	$6\frac{1}{16}$	19.242	29.465			
$3\frac{1}{8}$	9.8175	7.6699	$6\frac{1}{8}$	19.635	30.680	12	37.699	113.10
$3\frac{3}{16}$	10.014	7.9798	$6\frac{3}{16}$	20.028	31.919	$12\frac{1}{16}$	40.841	132.73
$3\frac{1}{4}$	10.210	8.2958	$6\frac{1}{4}$	20.420	33.183	$12\frac{1}{8}$	43.982	153.94
$3\frac{5}{16}$	10.407	8.6179	$6\frac{5}{16}$	20.813	34.472	$12\frac{3}{16}$	47.124	176.71
$3\frac{3}{8}$	10.603	8.9462	$6\frac{3}{8}$	21.206	35.785	$12\frac{1}{4}$	50.265	201.06
$3\frac{7}{16}$	10.799	9.2806	$6\frac{7}{16}$	21.598	37.122	$12\frac{5}{16}$	53.407	226.98
$3\frac{1}{2}$	10.996	9.6211				$12\frac{3}{8}$	56.549	254.47
$3\frac{9}{16}$	11.192	9.9678	7	21.991	38.485	$12\frac{1}{2}$	59.690	283.53
$3\frac{5}{8}$	11.388	10.321	$7\frac{1}{16}$	22.384	39.871	$12\frac{7}{16}$	62.832	314.16
$3\frac{3}{4}$	11.585	10.680	$7\frac{1}{8}$	22.776	41.282	$12\frac{1}{2}$	65.973	346.36
$3\frac{7}{8}$	11.781	11.045	$7\frac{3}{8}$	23.169	42.718	$12\frac{9}{16}$	69.115	380.13
$3\frac{15}{16}$	11.977	11.416	$7\frac{5}{8}$	23.562	44.197	$12\frac{1}{2}$	72.257	415.48
$4$	12.174	11.793	$7\frac{7}{8}$	23.955	45.664	$12\frac{11}{16}$	75.398	452.39
	12.370	12.177	$7\frac{15}{16}$	24.347	47.173	$12\frac{3}{4}$	78.540	490.87
				24.740	48.707			

## THERMOMETER SCALE CONVERSIONS

One Fahrenheit deg. = 5-9 deg. Centigrade = 4-9 deg. Réaumur. In the following conversion formulae:

F = Degrees Fahrenheit  
C = Degrees Centigrade  
R = Degrees Réaumur

Readings above freezing point 32 deg. F, zero C, zero R, are positive (+); readings below are treated as negative (—)

$$F = \frac{9C}{5} + 32; F = \frac{9R}{4} + 32; C = \frac{5(F-32)}{9}; R = \frac{4(F-32)}{9}$$

Freezing point F = 32 deg. = zero C = zero R.

Boiling point F = 212 deg. F = 100 deg. C = 80 deg. R.

**METRIC CONVERSION TABLES****U. S. to Metric**

1 inch = 25.4001 millimetres  
 1 foot = 0.304801 metres  
 1 yard = 0.914402 metres  
 1 mile = 1.60935 kilometres

**Metric to U. S.****Linear**

1 metre = 39.3700 inches  
 1 metre = 3.28083 feet  
 1 metre = 1.09361 yards  
 1 kilometre = 0.62137 miles

**Square**

1 square inch = 6.452 square centimetres    1 square centimetre = 0.1550 square ins.  
 1 square foot = 9.290 square decimetres    1 square metre = 10.7640 square feet  
 1 square yard = 0.836 square metres        1 square metre = 1.196 square yards.

**Cubic**

1 cu. inch = 16.387 cu. centimetres        1 cu. centimetre = 0.0610 cu. inches  
 1 cu. foot = 0.02832 cu. metres            1 cu. metre = 35.314 cu. feet  
 1 cu. yard = 0.765 cu. metres              1 cu. metre = 1.308 cu. yards

**Weight**

1 grain = 64.7989 milligrammes            1 milligramme = 0.01543 grains  
 1 av. oz. = 28.3495 grammes                1 kilogramme = 15432.36 grains  
 1 troy oz. = 31.10349 grammes            1 hectogramme = 3.5274 av. oz.  
 1 av. pound = 0.45359 kilogrammes       1 kilogramme = 2.20462 av. lbs.

**Capacity**

1 fluid drachm = 3.70 cu. centimetres       1 millilitre = 0.27 fluid drachms  
 1 fluid ounce = 29.57 millilitres           1 centilitre = 0.338 fluid ounces  
 1 quart = 0.94636 litres                    1 litre = 1.0567 quarts  
 1 gallon = 3.78544 litres                   1 dekalitre = 2.6417 gallons

**AREAS OF SMALL CIRCLES UP TO ONE INCH**

DIA.	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
Inc.	A R E A S									
.00	.0	.0078	.0314	.0706	.1256	.1963	.2827	.3848	.5026	.6362
.01	.000078	.0095	.03464	.0755	.132	.2043	.2922	.3959	.5153	.6504
.02	.00031	.0113	.038	.0804	.1385	.2124	.3014	.4071	.5281	.6648
.03	.0007	.0133	.0415	.0855	.1452	.2206	.3117	.4185	.5411	.6793
.04	.00125	.0154	.0452	.0908	.1520	.2290	.3217	.4301	.5542	.694
.05	.00196	.0177	.0491	.0962	.1590	.2376	.3318	.4418	.5674	.7088
.06	.00283	.0201	.0531	.1018	.1662	.2463	.3421	.4536	.5809	.7238
.07	.00385	.0227	.0572	.1075	.1735	.2552	.3526	.4657	.5945	.739
.08	.00503	.0255	.0616	.1134	.181	.2642	.3632	.4778	.6082	.7543
.09	.00638	.0283	.066	.1195	.1886	.2734	.3739	.4902	.6221	.7698

Across the top are the diameters of circles, and at the left are placed the increments increasing by .01 of an inch. Thus the area of a circle .55 of an inch in diameter, .2376 of a square inch, will be found under .5 and opposite .05.

**WATER AND MERCURY COLUMNS AND EQUIVALENT PRESSURES AT 62° F**

A column of water 1 in. high = .0736 in. of mercury = .0361 lb. per sq. in. = 5.196 lb. per sq. ft.

A column of mercury 1 in. high = 1.132 ft. of water = .49 lbs. per sq. in. = 70.56 lbs. per sq. ft.

A column of water 1 ft. high = .883 in. mercury = .433 lbs. per sq. in. = 62.355 lbs. per sq. ft.

1 lb. per sq. in. = 144 lbs. per sq. ft. = 27.71 in. water = 2.0416 in. mercury.

1 atmosphere (14.7 lb. per sq. in.) = 2116.3 lb. per sq. ft. = 33.947 ft. of water = 30 in. mercury.

Column of water one meter high = 1.43 lbs. per sq. in.

## WIRE GAUGES

Sizes in decimal parts of an inch

No. of Wire Gauge	American or Brown and Sharpe	Birmingham or Stubs' Iron Wire	Pounds per foot 1 inch wide B. W. G.	Washburn and Moen	Pounds per 100 feet round W. & M. G.	Polished Drill or Stubs' Iron Wire	No. of Wire Gauge
0000	.46	.454	1.512	.3938	40.94		0000
000	.40964	.425	1.415	.3625	34.73		000
00	.3648	.38	1.265	.3310	29.04		00
0	.32486	.34	1.132	.3065	27.66		0
1	.2893	.3	1.000	.2830	21.23	.227	1
2	.25763	.284	.946	.2625	18.34	.219	2
3	.22942	.259	.863	.2437	15.78	.212	3
4	.20431	.238	.793	.2253	13.39	.207	4
5	.18194	.22	.733	.2070	11.35	.204	5
6	.16202	.203	.676	.1920	9.73	.201	6
7	.14428	.18	.600	.1770	8.03	.199	7
8	.12849	.165	.550	.1620	6.96	.197	8
9	.11443	.148	.493	.1483	5.08	.194	9
10	.10189	.134	.446	.1350	4.83	.191	10
11	.090742	.12	.400	.1205	3.82	.188	11
12	.080808	.109	.363	.1055	2.92	.185	12
13	.071961	.095	.316	.0915	2.24	.182	13
14	.064084	.083	.276	.0800	1.69	.180	14
15	.057068	.072	.240	.0720	1.37	.178	15
16	.05082	.065	.217	.0625	1.05	.175	16
17	.045257	.058	.193	.0540	.77	.172	17
18	.040303	.049	.165	.0475	.58	.168	18
19	.03589	.042	.140	.0410	.45	.164	19
20	.031961	.035	.117	.0348	.32	.161	20
21	.028462	.032	.107	.03175	.27	.157	21
22	.025347	.028	.093	.0286	.21	.155	22
23	.022571	.025	.083	.0258	.175	.153	23
24	.0201	.022	.073	.0230	.140	.151	24
25	.0179	.02	.067	.0204	.116	.148	25
26	.01594	.018	.060	.0181	.093	.146	26
27	.014195	.016	.053	.0173	.083	.143	27
28	.012641	.014	.047	.0162	.074	.139	28
29	.011257	.013	.044	.0150	.061	.134	29
30	.010025	.012	.040	.0140	.054	.127	30
31	.008928	.01	.0333	.0132	.050	.120	31
32	.00795	.009	.0300	.0128	.046	.115	32
33	.00708	.008	.0266	.0118	.037	.112	33
34	.006304	.007	.0233	.0104	.030	.110	34
35	.005614	.005	.0167	.0095	.025	.108	35
36	.005	.054	.0133	.0090	.021	.106	36
37	.004453	....	....	....	....	.103	37
38	.003965	....	....	....	....	.101	38
39	.003531	....	....	....	....	.099	39
40	.003144	....	....	....	....	.092	40

## WEIGHT OF ONE CUBIC FOOT OF WATER AT VARIOUS TEMPERATURES

62.418 lbs.	at	32 ° F.	(Freezing point)
62.425 "	"	39.1° F	(Maximum density)
62.355 "	"	62 ° F.	(Standard temperature)
59.76 "	"	212 ° F.	(One atmosphere pressure)

## WEIGHT AND U. S. STANDARD GAUGES

### For Steel Sheets

No. of Gauge	Weight per Sq. feet in lbs.	Fractions of an inch	Decimal points of an inch	No. of Gauge	Wt. per Sq. feet in lbs.	Fractions of an inch	Decimal points of an inch
0000000	20.4	1-2	.5	13	3.825	3-32	.09375
000000	19.125	15-32	.46875	14	3.1875	5-64	.078125
00000	17.85	7-16	.4375	15	2.8688	9-128	.0703125
0000	16.575	13-32	.40625	16	2.55	1-16	.0625
000	15.3	3-8	.375	17	2.295	9-160	.05625
00	14.025	11-32	.34375	18	2.04	1-20	.05
0	12.75	5-16	.3125	19	1.785	7-160	.04375
1	11.475	9-32	.28125	20	1.53	3-80	.0375
2	10.8375	17-64	.265625	21	1.4025	11-320	.034375
3	10.2	1-4	.25	22	1.275	1-32	.03125
4	9.5625	15-64	.234375	23	1.1475	9-320	.028125
5	8.925	7-32	.21875	24	1.02	1-40	.025
6	8.2875	13-64	.203125	25	.8923	7-320	.021875
7	7.65	3-16	.1875	26	.765	3-160	.01875
8	7.0125	11-64	.171875	27	.7013	11-640	.0171875
9	6.375	5-32	.15625	28	.6375	1-64	.015625
10	5.7375	9-64	.140625	29	.5738	9-640	.0140625
11	5.1	1-8	.125	30	.51	1-80	.0125
12	4.4625	7-64	.109375				

## STANDARD METRIC 60° THREADS

Diameter of Screw	Pitch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread	Diameter of Screw	Pitch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
Millimetres	Millimetres	Millimetres	Millimetres	Millimetres	Millimetres	Millimetres	Millimetres
3	.5	2.35	.06	27	3.0	23.10	.38
4	.75	3.03	.09	28	3.0	24.10	.38
5	.75	4.03	.09	30	3.5	25.45	.44
6	1.0	4.70	.13	32	3.5	27.45	.44
7	1.0	5.70	.13	33	3.5	28.45	.44
8	1.0	6.70	.13	34	3.5	29.45	.44
8	1.25	6.38	.16	36	4.0	30.80	.5
9	1.0	7.70	.13	38	4.0	32.80	.5
9	1.25	7.38	.16	39	4.0	33.80	.5
10	1.5	8.05	.19	40	4.0	34.80	.5
11	1.5	9.05	.19	42	4.5	36.15	.56
12	1.5	10.05	.19	44	4.5	38.15	.56
12	1.75	9.73	.22	45	4.5	39.15	.56
14	2.0	11.40	.25	46	4.5	40.15	.56
16	2.0	13.40	.25	48	5.0	41.51	.63
18	2.5	14.75	.31	50	5.0	43.51	.63
20	2.5	16.75	.31	52	5.0	45.51	.63
22	2.5	18.75	.31	56	5.5	48.86	.69
22	3.0	18.10	.38	60	5.5	52.86	.69
24	3.0	20.10	.38	64	6.0	56.21	.75
26	3.0	22.10	.38	68	6.0	60.21	.75
				72	6.5	63.56	.81
				76	6.5	67.56	.81
				80	7.0	70.91	.88

### Compound Equivalents of Pressure.

- 1 gramme per sq. millimetre = 1.422 lbs. per sq. in.
- 1 kilogramme per sq. millimetre = 1422.32 lbs. per sq. in.
- 1 kilogramme per sq. centimetre = 14.223 lbs. per sq. in.
- 1 lb. per sq. in. = 0.070308 kilogramme per sq. centimetre.
- 1,000 lbs. per sq. in. = 0.70308 kilogramme per sq. millimetre.
- 1 atmosphere 14.7 lbs. = 1.0335 kilogrammes per sq. centimetre.

UNITED STATES STANDARD 60° SCREW THREADS

Diameter of Screw	Threads per inch	Diameter at Root of Thread	Width of Flat at Top and Bottom of Thread
$\frac{1}{4}$	20	.185	.0062
$\frac{3}{16}$	18	.2403	.0069
$\frac{1}{2}$	16	.2936	.0078
$\frac{5}{8}$	14	.3447	.0089
$\frac{3}{4}$	13	.4001	.0096
$\frac{7}{8}$	12	.4542	.0104
$1$	11	.5069	.0114
$1\frac{1}{8}$	10	.6201	.0125
$1\frac{1}{4}$	9	.7307	.0139
$1\frac{3}{8}$	8	.8376	.0156
$1\frac{1}{2}$	7	.9394	.0179
$1\frac{3}{4}$	7	1.0644	.0179
$2$	6	1.1585	.0208
$2\frac{1}{4}$	6	1.2835	.0208
$2\frac{1}{2}$	$5\frac{1}{2}$	1.3888	.0227
$2\frac{3}{4}$	5	1.4902	.0250
$3$	5	1.6152	.0250
$3\frac{1}{4}$	$4\frac{1}{2}$	1.7113	.0278
$3\frac{1}{2}$	$4\frac{1}{2}$	1.9613	.0278
$3\frac{3}{4}$	4	2.1752	.0313
$4$	4	2.4252	.0313
$4\frac{1}{4}$	$3\frac{1}{2}$	2.6288	.0357
$4\frac{1}{2}$	$3\frac{1}{2}$	2.8788	.0357
$4\frac{3}{4}$	$3\frac{1}{2}$	3.1003	.0385
$5$	3	3.3170	.0417
$5\frac{1}{4}$	3	3.5670	.0417
$5\frac{1}{2}$	$2\frac{7}{8}$	3.7982	.0435
$5\frac{3}{4}$	$2\frac{3}{4}$	4.0276	.0455
$6$	$2\frac{3}{8}$	4.2551	.0476
$6\frac{1}{4}$	$2\frac{1}{2}$	4.4804	.0500
$6\frac{1}{2}$	$2\frac{1}{2}$	4.7304	.0500
$6\frac{3}{4}$	$2\frac{3}{8}$	4.9503	.0526
$7$	$2\frac{3}{8}$	5.2030	.0526
$7\frac{1}{4}$	$2\frac{1}{4}$	5.4226	.0556

The rule given by Mr. Sellers, the originator of the U. S. Standard, for proportioning the thread is as follows: Divide the pitch into eight equal parts, take off one part from the top and fill in one part in the bottom of the thread; then the flat top and bottom will each equal one-eighth of the pitch, the wearing surface will be three-quarters of the pitch, and the diameter of the screw at the bottom of the thread will be expressed by the formula:

Diameter at bottom of thread = Diameter of bolt -  $\frac{1}{\text{No. threads per inch.}}$

USEFUL EQUIVALENTS, LIQUIDS

One lb of Water	=	$\left\{ \begin{array}{l} 27.72 \text{ cubic inches} \\ .083 \text{ U. S. Gallon} \\ .4537 \text{ kilo} \end{array} \right.$
One Cubic Foot of Water	=	$\left\{ \begin{array}{l} 7.48 \text{ U. S. Gallons} \\ 28.375 \text{ litres} \\ .0283 \text{ cubic metre} \\ 62.35 \text{ lbs. at } 62^{\circ} \text{ F.} \\ .557 \text{ cwt.} \\ .028 \text{ ton} \end{array} \right.$
One U. S. Gallon	=	$\left\{ \begin{array}{l} 231 \text{ cubic inches of water, } 62^{\circ} \text{ F.} \\ .1337 \text{ cubic foot} \\ 8.335 \text{ lbs.} \\ 3.8 \text{ litres} \end{array} \right.$

## Rule for Calculating Weight of Steel Bars, Etc.

Having the number of cubic inches in any bar, to find its weight in steel, multiply by the decimal .2833 if exact weight is desired: or multiply by .3 if a practical weight, such as you are likely to get, is wanted. For the weight of wrought iron, multiply the cubic inches by .28. For the weight of cast iron, multiply the cubic inches by .26.

### WEIGHT OF BAR-STEEL PER FOOT

Size in inches

SQUARE		ROUND		OCTAGON	
Size	Lbs.	Size	Lbs.	Size	Lbs.
$\frac{1}{8}$	.05	$\frac{1}{8}$	.04	$\frac{1}{8}$	.04
$\frac{3}{16}$	.12	$\frac{3}{16}$	.09	$\frac{3}{16}$	.10
$\frac{1}{4}$	.21	$\frac{1}{4}$	.17	$\frac{1}{4}$	.18
$\frac{5}{16}$	.33	$\frac{5}{16}$	.26	$\frac{5}{16}$	.28
$\frac{3}{8}$	.48	$\frac{3}{8}$	.38	$\frac{3}{8}$	.40
$\frac{7}{16}$	.65	$\frac{7}{16}$	.51	$\frac{7}{16}$	.54
$\frac{1}{2}$	.85	$\frac{1}{2}$	.67	$\frac{1}{2}$	.70
$\frac{9}{16}$	1.08	$\frac{9}{16}$	.85	$\frac{9}{16}$	.89
$\frac{5}{8}$	1.33	$\frac{5}{8}$	1.04	$\frac{5}{8}$	1.10
$\frac{11}{16}$	1.61	$\frac{11}{16}$	1.27	$\frac{11}{16}$	1.33
$\frac{3}{4}$	1.92	$\frac{3}{4}$	1.50	$\frac{3}{4}$	1.58
$\frac{13}{16}$	2.24	$\frac{13}{16}$	1.76	$\frac{13}{16}$	1.83
$\frac{7}{8}$	2.60	$\frac{7}{8}$	2.04	$\frac{7}{8}$	2.16
$\frac{15}{16}$	3.06	$\frac{15}{16}$	2.35	$\frac{15}{16}$	2.48
1	3.40	1	2.67	1	2.82
$1\frac{1}{8}$	4.30	$1\frac{1}{8}$	3.38	$1\frac{1}{8}$	3.56
$1\frac{1}{4}$	5.31	$1\frac{1}{4}$	4.17	$1\frac{1}{4}$	4.40
$1\frac{3}{8}$	6.43	$1\frac{3}{8}$	5.05	$1\frac{3}{8}$	5.32
$1\frac{1}{2}$	7.65	$1\frac{1}{2}$	6.01	$1\frac{1}{2}$	6.34
$1\frac{5}{8}$	8.98	$1\frac{5}{8}$	7.05	$1\frac{5}{8}$	7.32
$1\frac{3}{4}$	10.40	$1\frac{3}{4}$	8.18	$1\frac{3}{4}$	8.64
$1\frac{7}{8}$	11.90	$1\frac{7}{8}$	9.38	$1\frac{7}{8}$	9.92
2	13.60	2	10.71	2	11.28
$2\frac{1}{8}$	15.40	$2\frac{1}{8}$	12.05	$2\frac{1}{8}$	12.71
$2\frac{1}{4}$	17.20	$2\frac{1}{4}$	13.60	$2\frac{1}{4}$	14.24
$2\frac{3}{8}$	19.20	$2\frac{3}{8}$	15.10	$2\frac{3}{8}$	15.88
$2\frac{1}{2}$	21.20	$2\frac{1}{2}$	16.68	$2\frac{1}{2}$	17.65
$2\frac{5}{8}$	23.50	$2\frac{5}{8}$	18.39	$2\frac{5}{8}$	19.45
$2\frac{3}{4}$	25.70	$2\frac{3}{4}$	20.18	$2\frac{3}{4}$	21.28
$2\frac{7}{8}$	28.20	$2\frac{7}{8}$	22.06	$2\frac{7}{8}$	23.28
3	30.60	3	24.10	3	25.36
$3\frac{1}{8}$	33.13	$3\frac{1}{8}$	26.12	$3\frac{1}{8}$	27.50
$3\frac{1}{4}$	35.90	$3\frac{1}{4}$	28.30	$3\frac{1}{4}$	30.28
$3\frac{3}{8}$	38.64	$3\frac{3}{8}$	30.45	$3\frac{3}{8}$	32.10
$3\frac{1}{2}$	41.60	$3\frac{1}{2}$	32.70	$3\frac{1}{2}$	34.56
$3\frac{5}{8}$	44.57	$3\frac{5}{8}$	35.20	$3\frac{5}{8}$	37.05
$3\frac{3}{4}$	47.80	$3\frac{3}{4}$	37.54	$3\frac{3}{4}$	39.68
4	54.40	4	42.72	4	45.12
$4\frac{1}{4}$	61.40	$4\frac{1}{4}$	48.30	$4\frac{1}{4}$	50.84
$4\frac{1}{2}$	68.90	$4\frac{1}{2}$	54.60	$4\frac{1}{2}$	56.96
$4\frac{3}{4}$	76.70	$4\frac{3}{4}$	60.30	$4\frac{3}{4}$	63.52
5	85.00	5	66.80	5	70.60
$5\frac{1}{4}$	93.70	$5\frac{1}{4}$	72.60	$5\frac{1}{4}$	77.80
$5\frac{1}{2}$	102.80	$5\frac{1}{2}$	80.80	$5\frac{1}{2}$	85.15
$5\frac{3}{4}$	112.40	$5\frac{3}{4}$	88.30	$5\frac{3}{4}$	93.12
6	122.40	6	96.10	6	101.05





## CARRYING CAPACITIES OF BALL BEARINGS

The carrying capacity of ball bearings is usually based on the number and diameter of balls. However, it is well known that very small details have a decided influence on the carrying capacity of the bearing as a whole and for this reason comparisons of the carrying capacity should be made between only those of similar type and similarly mounted. The carrying capacities listed in various catalogs and tables are those that the individual makers consider safe and there are, of course, variations in the figures as some makers consider a safe carrying capacity one only a small percentage of the ultimate limit while others consider as safe only figures above the ultimate limit. For these reasons it is best to consult the experience of the maker of the particular bearing giving details as to the proposed use and method of employing the bearing.

The following tables of the carrying capacities of bearings should be consulted with these facts always in mind.

### DIMENSIONS, RADIAL AND THRUST Capacities of Annular (Radial) H. B. Ball Bearings

LIGHT	MEDIUM	HEAVY	BORE m/m	Inches	DIAM. m/m	Inches	WIDTH m/m	Inches	RADIAL LOAD	THRUST LOAD	WEIGHT BALL IN LBS.	BALL DIAM.
200			10	0.3937	30	1.1811	9	0.3543	120	12	0.09	
	300		10	0.3937	35	1.3779	11	0.4331	200	20	0.11	$\frac{1}{4}$
201			12	0.4724	32	1.2598	10	0.3937	140	14	0.10	
	301		12	0.4724	37	1.4567	12	0.4724	240	24	0.14	$\frac{1}{4}$
202			15	0.5905	35	1.3779	11	0.4331	160	16	0.12	
	302		15	0.5905	42	1.6535	13	0.5118	280	28	0.19	$\frac{1}{4}$
203			17	0.6693	40	1.5748	12	0.4724	250	25	0.18	
	303		17	0.6693	47	1.8503	14	0.5512	370	37	0.25	$\frac{5}{16}$
		403	17	0.6693	62	2.4410	17	0.6693	850	85	0.56	$\frac{1}{2}$
204			20	0.7874	47	1.8503	14	0.5512	320	32	0.23	$\frac{1}{4}$
	304		20	0.7874	52	2.0473	15	0.5905	440	44	0.33	$\frac{5}{16}$
		404	20	0.7874	72	2.8346	19	0.7480	1050	105	0.85	$\frac{9}{16}$
205			25	0.9842	52	2.0473	15	0.5905	350	35	0.26	$\frac{1}{4}$
	305		25	0.9842	62	2.4410	17	0.6693	620	62	0.53	$\frac{5}{16}$
		405	25	0.9842	80	3.1496	21	0.8268	1320	132	1.14	$\frac{3}{4}$
206			30	1.1811	62	2.4410	16	0.6299	550	55	0.44	$\frac{5}{16}$
	306		30	1.1811	72	2.8346	19	0.7480	860	86	0.77	$\frac{7}{16}$
		406	30	1.1811	90	3.5433	23	0.9055	1600	160	1.56	$\frac{1}{2}$
207			35	1.3779	72	2.8346	17	0.6693	600	60	0.66	$\frac{5}{16}$
	307		35	1.3779	80	3.1496	21	0.8268	1100	110	0.98	$\frac{3}{4}$
		407	35	1.3779	100	3.9370	25	0.9842	1900	190	2.00	$\frac{3}{4}$
208			40	1.5748	80	3.1496	18	0.7086	860	86	0.83	$\frac{3}{8}$
	308		40	1.5748	90	3.5433	23	0.9055	1450	145	1.35	$\frac{9}{16}$
		408	40	1.5748	110	4.3307	27	1.0630	2200	220	2.58	$\frac{1}{2}$
209			45	1.7716	85	3.3464	19	0.7480	950	95	0.96	$\frac{3}{8}$
	309		45	1.7716	100	3.9370	25	0.9842	1750	175	1.79	$\frac{7}{16}$
		409	45	1.7716	120	4.7244	29	1.1417	2500	250	3.33	$\frac{3}{4}$
210			50	1.9685	90	3.5433	20	0.7874	1000	100	1.09	$\frac{3}{8}$
	310		50	1.9685	110	4.3307	27	1.0630	2100	210	2.35	$\frac{1}{2}$
		410	50	1.9685	130	5.1181	31	1.2205	3400	340	4.18	$\frac{1}{2}$
211			55	2.1653	100	3.9370	21	0.8268	1160	116	1.36	$\frac{7}{16}$
	311		55	2.1653	120	4.7244	29	1.1417	2400	240	2.99	$\frac{3}{4}$
		411	55	2.1653	140	5.5118	33	1.2992	3900	390	5.07	1-
212			60	2.3622	110	4.3307	22	0.8661	1550	155	1.75	$\frac{1}{2}$
	312		60	2.3622	130	5.1181	31	1.2205	2800	280	3.72	$\frac{1}{2}$
		412	60	2.3622	150	5.9055	35	1.3779	4400	440	6.12	1-
213			65	2.5590	120	4.7244	23	0.9055	1670	167	2.28	$\frac{1}{2}$
	313		65	2.5590	140	5.5118	33	1.2992	3300	330	4.49	$\frac{3}{4}$
		413	65	2.5590	160	6.2992	37	1.4567	4900	490	7.22	1-
214			70	2.7559	125	4.9212	24	0.9449	1820	182	2.50	$\frac{1}{2}$
	314		70	2.7559	150	5.9055	35	1.3779	4000	400	5.46	$\frac{1}{2}$
		414	70	2.7559	180	7.0866	42	1.6535	6200	620	10.54	1-
215			75	2.9527	130	5.1181	25	0.9842	2130	213	2.63	$\frac{9}{16}$
	315		75	2.9527	160	6.2992	37	1.4567	4400	440	6.58	1-
216			80	3.1496	140	5.5118	26	1.0236	2650	265	3.22	$\frac{5}{8}$
	316		80	3.1496	170	6.6929	39	1.5354	5000	500	7.89	1-
		416	80	3.1496	200	7.8740	48	1.8897	7300	730	14.58	1-

**DIMENSIONS, RADIAL AND THRUST****Capacities of Annular (Radial) H. B. Ball Bearings—Continued**

LIGHT	MEDIUM	HEAVY	BORE m/m	Inches	DIAM. m/m	Inches	WIDTH m/m	Inches	RADIAL LOAD	THRUST LOAD	WEIGHT IN LBS.	BALL DIAM.
217			85	3.3464	150	5.9055	28	1.1023	2850	285	3.97	$1\frac{1}{16}$
	317		85	3.3464	180	7.0866	41	1.6142	5700	570	9.27	$1\frac{1}{8}$
218			90	3.5433	160	6.2992	30	1.1811	3100	310	4.84	$\frac{3}{4}$
	318		90	3.5433	190	7.4803	43	1.6929	6400	610	10.47	$1\frac{1}{16}$
		418	90	3.5433	225	8.8582	54	2.1260	10000	1000	20.15	$1\frac{5}{8}$
219			95	3.7402	170	6.6929	32	1.2598	3750	375	5.94	$\frac{3}{4}$
	319		95	3.7402	200	7.8740	45	1.7716	7000	700	12.27	$1\frac{1}{4}$
220			100	3.9370	180	7.0866	34	1.3386	3950	395	7.17	$1\frac{3}{16}$
	320		100	3.9370	215	8.4645	47	1.8504	7700	770	15.23	$1\frac{1}{8}$
		420	100	3.9370	265	10.4330	60	2.3622	14000	1400	33.44	$1\frac{5}{8}$
221			105	4.1338	190	7.4803	36	1.4173	4600	460	8.48	$\frac{7}{8}$
	321		105	4.1338	225	8.8582	49	1.9291	8400	840	17.19	$1\frac{3}{8}$
222			110	4.3307	200	7.8740	38	1.4960	5000	500	10.26	$\frac{7}{8}$
	322		110	4.3307	240	9.4488	50	1.9685	10000	1000	20.29	$1\frac{1}{2}$

The number completely identifies each bearing

The inch dimensions are the nearest equivalents to the even millimeters in which the bearings are made. The metric sizes are retained to ensure interchangeability of the American-made Hess-Bright Bearings with the German and French "DWF."

The loads cited are safe for steady speeds up to 300 RPM and constant load. For all other conditions, suitable allowances must be made as dictated by experience. The loads cited include a safety factor of over ten.

In general, these bearings will sustain one-tenth of the radial load for thrust only.

**PRESS FIT ALLOWANCES FOR ANNULAR BALL BEARINGS****BEARING****SHAFT DIAMETERS**

BORE		MINIMUM		MAXIMUM	
M-M	Inches	M-M	Inches	M-M	Inches
10	0.3937	10.005	0.3939	10.020	0.3945
12	0.4724	12.005	0.4726	12.020	0.4732
15	0.5905	15.005	0.5907	15.020	0.5913
17	0.6693	17.005	0.6695	17.020	0.6701
20	0.7874	20.005	0.7876	20.020	0.7882
22	0.8661	22.010	0.8665	22.025	0.8671
25	0.9842	25.010	0.9846	25.025	0.9852
27	1.0630	27.010	1.0634	27.025	1.0639
30	1.1811	30.010	1.1815	30.025	1.1821
35	1.3779	35.010	1.3783	35.025	1.3789
40	1.5748	40.010	1.5752	40.025	1.5758
45	1.7716	45.015	1.7722	45.030	1.7728
50	1.9685	50.015	1.9691	50.030	1.9697
55	2.1653	55.015	2.1659	55.030	2.1665
60	2.3622	60.015	2.3628	60.030	2.3634
65	2.5590	65.015	2.5596	65.030	2.5602
70	2.7559	70.015	2.7565	70.030	2.7571
75	2.9527	75.015	2.9533	75.030	2.9539
80	3.1496	80.020	3.1504	80.035	3.1510
85	3.3464	85.020	3.3472	85.035	3.3478
90	3.5433	90.020	3.5441	90.035	3.5447
95	3.7401	95.020	3.7409	95.035	3.7415
100	3.9370	100.020	3.9378	100.035	3.9384
105	4.1338	105.020	4.1346	105.035	4.1352
110	4.3307	110.020	4.3315	110.035	4.3321

Experience has shown that with shafts sized in accordance with this table, the inner races of the bearings will have the proper fit; if the shaft is smaller, the races will creep and cut down the shaft; if the shaft is larger, undue force must be exerted to get the bearings on, with grave danger of cracking the inner race.

STANDARD SIZES AND WEIGHTS OF STEEL BALL

Dia. in ins.	Dia. Decimal	No. per pound.	Dia. in ins.	Dia. Decimal.	W'ht each,ozs.
$\frac{1}{16}$ "	.0625	27,904	$\frac{13}{16}$ "	.8125	$1\frac{1}{2}$
$\frac{3}{32}$ "	.0937	8,264	$\frac{7}{8}$ "	.8750	$1\frac{3}{4}$
$\frac{1}{8}$ "	.1250	3,400	$\frac{15}{16}$ "	9.375	2
$\frac{5}{32}$ "	.1563	1,770	1"	1.000	$2\frac{1}{2}$
$\frac{3}{16}$ "	.1875	1,030	$1\frac{1}{8}$ "	1.125	$3\frac{1}{2}$
$\frac{1}{4}$ "	.2188	640	$1\frac{1}{4}$ "	1.250	$4\frac{3}{4}$
$\frac{5}{16}$ "	.2500	430	$1\frac{3}{8}$ "	1.375	$6\frac{1}{4}$
$\frac{3}{8}$ "	.2613	300	$1\frac{1}{2}$ "	1.500	8
$\frac{7}{16}$ "	.3125	220	$1\frac{3}{4}$ "	1.625	10
$\frac{1}{2}$ "	.2438	165	$1\frac{7}{8}$ "	1.750	13
$\frac{9}{16}$ "	.3750	125	$1\frac{5}{8}$ "	1.875	$15\frac{1}{2}$
$\frac{5}{8}$ "	.4375	80	2"	2.000	$19\frac{1}{4}$
$\frac{3}{4}$ "	.5000	52	$2\frac{1}{4}$ "	2.250	27
$\frac{7}{8}$ "	.5625	36	$2\frac{1}{2}$ "	2.500	37
$\frac{15}{16}$ "	.6250	28	$2\frac{3}{4}$ "	2.750	49
	.6875	21	3"	3.000	64
	.7500	16	$3\frac{1}{4}$ "	3.250	$81\frac{1}{2}$
			$3\frac{1}{2}$ "	3.500	$101\frac{1}{2}$
			$3\frac{3}{4}$ "	3.750	125
			4"	4.000	152

BALL BEARING DATA\*

Surface of a ball =  $D^2 \times 3.1416$ .

Volume =  $D^3 \times .5236$ .

Circumference =  $D \times 3.1416$ .

To determine the diameter of the circumscribed circle, enclosing a ring of a given number of balls:

Multiply the factor in table opposite the number of balls in ring, by the diameter of ball plus clearance between each pair of balls, and add to this product the diameter of ball.

D = (D + c x F) + d.

D = Diameter of Enclosing circle.

d = Diameter of Ball.

F = Factor in Table.

C = Clearance between each pair of balls.

Table of Factors

No. of Balls.	Factor.	No. of Balls.	Factor.	No. of Balls.	Factor.	No. of Balls.	Factor.
6	2.0000	19	6.0756	32	10.202	44	14.018
7	2.3068	20	6.3925	33	10.520	45	14.336
8	2.6131	21	6.7095	34	10.838	46	14.654
9	2.9238	22	7.0266	35	11.156	47	14.972
10	3.2361	23	7.3338	36	11.474	48	15.290
11	3.5490	24	7.6613	37	11.792	49	15.608
12	3.8637	25	7.9787	38	12.110	50	15.926
13	4.1785	26	8.2962	39	12.427	51	16.244
14	4.4940	27	8.6138	40	12.745	52	16.562
15	4.8097	28	8.9315	41	13.064	53	16.880
16	5.1259	29	9.2493	42	13.382	54	17.198
17	5.4423	30	9.5668	43	13.700	55	17.517
18	5.7588	31	9.8845				

The following is another formula which gives the radius of the enclosing circle of a ring of balls:

$$R = r + \frac{r}{\text{Sin.} \left( \frac{180^\circ}{n} \right)}$$

R = radius of enclosing circle.

r = Radius of Ball.

n = Number of balls in ring.

\*American Ball Co. Providence, R. I.

**TESTS OF CRUSHING LOADS OF RIEHLE BROS. STEEL BALLS**

Tests were made with balls placed between flat, hardened, tool-steel plates

Size of Balls	ULTIMATE LOAD IN LBS.					Average of 5 balls.
	Ball No. 1.	Ball No. 2	Ball No. 3	Ball No. 4	Ball No. 5	
$\frac{1}{2}$ "	41540	21430	47110	42550	36770	37880
$\frac{5}{8}$ "	54000	45150	52000	70850	34700	51330
$\frac{3}{4}$ "	57550	22060	89000	70150	62890	60330
$\frac{7}{8}$ "	61250	51360	73200	62190	60000	61600
1"	96560	84290	89000	112000	91100	94590
$1\frac{1}{8}$ "	114800	77710	99000	113100	91190	99160
$1\frac{1}{4}$ "	144650	124900	142270	135480	139400	137340
$1\frac{3}{4}$ "	161630	163480	128600	106060	167930	145540
$1\frac{3}{4}$ "	126240	178730	166940	159800	156340	157610

Ball No. 3 ( $\frac{5}{8}$ " Dia.) cracked plate at 52,000 lbs., and on second application of load ball broke at 31,900 lbs.

Ball No. 3 (1" Dia.) cracked plate at 89,000 lbs., and on second application of load ball broke at 83,050 lbs.

Ball No. 4 (1" Dia.) broke and cracked plate at 112,000 lbs.

Ball No. 3 ( $1\frac{1}{8}$ " Dia.) cracked plate at 130,330 lbs., and on second application of load cracked plate at 130,000 lbs. On third application of load ball broke at 142,270 lbs.

**TENSILE TESTS OF IMPORTED CHROME NICKEL STEEL\***

Bischoff's Chrome Nickel Steel—Annealed for machining specimen No. 2.

Bischoff's Chrome Nickel Steel—Oil treated specimen No. 1.

Dimensions	.500" Dia.		.500" Dia.	
Area	.196	Sq. in.	.196	Sq. in.
Reduced Dimensions	.308" Dia.		.366" Dia.	
Reduced Area	.075	Sq. in.	.105	Sq. in.
Reduction of Area	61.7	%	46.4	%
Elastic Limit	22,500	lbs.	32,000	lbs.
E. L. per Sq. in.	114,600	"	163,300	"
Maximum Strength	25,000	"	40,000	"
M. S. per Sq. in.	127,500	"	204,100	"
Elongation by inches	.08-.34		.19-.13	
Elongation in 2"	21.0	%	16.0	%
Fracture	Silky cup—fibrous		Silky Cup	

\*Supplied by Sier-Bath Company, New York. Tests by Henry Souther Engineering Co., Hartford, Connecticut.

## MAXIMUM STEADY LOAD CAPACITY (RADIAL & THRUST) OF NEW DEPARTURE ANNULAR BALL BEARINGS AT DIFFERENT SPEEDS

The following table shows the maximum steady load capacity in pounds (both radial and thrust) of New Departure "Two-in-One" Annular Ball Bearings, at different speeds. This table is based upon the relation existing between load and speed to give equal life of bearings under the different loads and speeds stated. The law of decreasing loads for increasing speeds applies to any form of radial bearing.

Number of Bearing	300 r. p. m.	600 r. p. m.	1000 r. p. m.	1500 r. p. m.	2000 r. p. m.	3000 r. p. m.
200	300	210	160	130	120	100
201	390	270	210	170	150	120
202	450	310	250	200	170	140
203	520	360	280	230	200	160
204	550	400	310	250	220	180
205	590	450	350	290	250	200
206	700	500	390	320	270	220
207	1100	800	620	500	450	360
208	1320	950	730	600	520	420
209	1720	1300	1000	820	710	580
210	1980	1500	1160	950	820	680
211	2340	1800	1400	1150	1000	810
212	2820	2100	1620	1320	1150	950
213	3340	2500	1920	1580	1370	1120
214	3640	2600	2000	1640	1420	1160
215	3900	2700	2100	1700	1480	1200
216	4700	3300	2500	2100	1800	1480
217	4900	3500	2700	2200	1900	1560
218	6650	4600	3500	2900	2500	2000
219	7200	5000	3800	3100	2700	2200
220	7900	5500	4200	3500	3000	2500
221	9600	6700	5200	4200	3700	3000
222	10000	7000	5400	4400	3800	3100
300	400	280	220	170	150	130
301	440	310	240	200	170	140
302	500	350	270	220	190	160
303	620	440	340	280	240	200
304	690	480	370	300	260	220
305	990	700	540	440	380	320
306	1350	950	730	600	520	430
307	2000	1400	1040	880	770	630
308	2340	1700	1300	1060	930	760
309	2800	1960	1500	1240	1040	880
310	3500	2500	1920	1580	1380	1120
311	4150	2900	2200	1820	1600	1300
312	5300	3700	2900	2300	2000	1660
313	6200	4300	3300	2700	2400	1920
314	7200	5000	3800	3100	2700	2200
315	8250	5700	4400	3600	3100	2500
316	9200	6400	5000	4000	3500	2900
317	10420	7300	5600	4600	4000	3300
318	11260	7900	6100	5000	4300	3500
319	12720	8900	6800	5600	4900	4000
320	14250	10000	7700	6300	5500	4500
321	15890	11200	8600	7000	6200	5000
322	17600	12320	9500	7700	6800	5500
403	1225	860	660	540	470	390
404	1600	1120	860	700	620	500
405	2000	1400	1040	880	770	630
406	2550	1780	1360	1120	970	800
407	3140	2200	1700	1380	1200	990

## MAXIMUM STEADY LOAD CAPACITY OF NEW DEPARTURE BALL BEARINGS—Continued

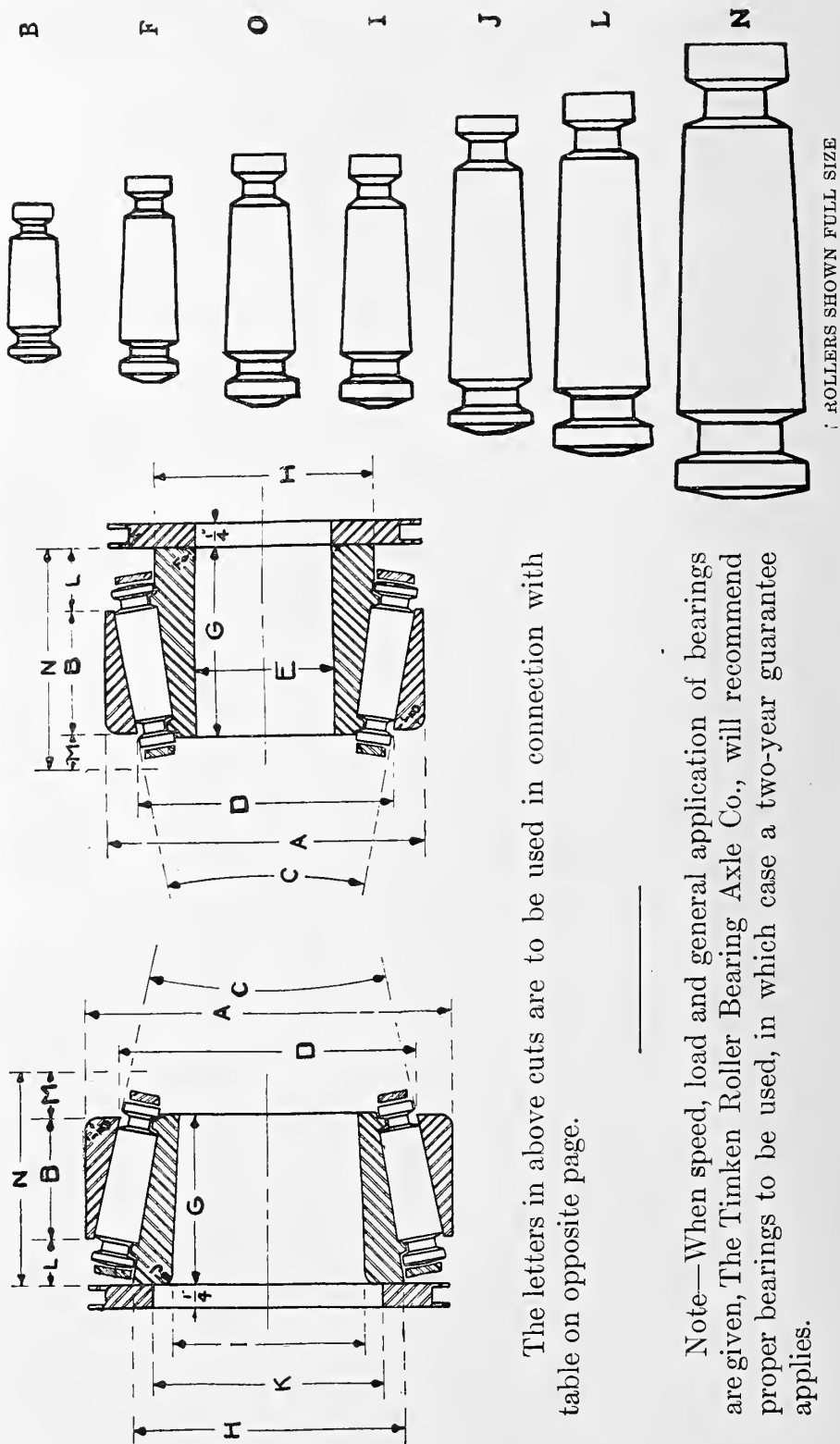
Number of Bearing	300 r. p. m.	600 r. p. m.	1000 r. p. m.	1500 r. p. m.	2000 r. p. m.	3000 r. p. m.
408	3800	2650	2050	1660	1460	1200
409	4500	3200	2500	2000	1760	1440
410	5300	3700	2850	2350	2000	1660
411	5800	4100	3200	2600	2250	1820
412	6730	4700	3600	3000	2600	2100
413	7700	5400	4150	3400	2950	2400
414	9900	7000	5400	4400	3850	3150
416	12000	8400	6450	5300	4600	3770
418	14800	10400	8000	6500	5700	4650

## DIMENSIONS OF NEW DEPARTURE "TWO-IN-ONE" ANNULAR BALL BEARINGS

Bearing Number	Bore		Diameter		Width	
	Inches	M/M	Inches	M/M	Inches	M/M
200	.3937	10	1.1811	30	.50	12.70
201	.4724	12	1.2598	32	.50	12.70
202	.5905	15	1.3779	35	.50	12.70
203	.6693	17	1.5748	40	.30	12.70
204	.7874	20	1.8504	47	.75	19.05
205	.9842	25	2.0472	52	.75	19.05
206	1.1811	30	2.4409	62	.75	19.05
207	1.3779	35	2.8346	72	.875	22.22
208	1.5748	40	3.1496	80	1.00	25.40
209	1.7716	45	3.3464	85	1.00	25.40
210	1.9685	50	3.5433	90	1.00	25.40
211	2.1653	55	3.9370	100	1.1875	30.16
212	2.3622	60	4.3307	110	1.3750	34.92
213	2.5590	65	4.7244	120	1.3750	34.92
214	2.7559	70	4.9212	125	1.4375	36.51
215	2.9527	75	5.1181	130	1.4375	36.51
216	3.1496	80	5.5118	140	1.6250	41.27
217	3.3464	85	5.9055	150	1.7500	44.45
218	3.5433	90	6.2992	160	2.	50.80
219	3.7401	95	6.6929	170	2.1875	55.56
220	3.9370	100	7.0866	180	2.3750	60.32
221	4.1338	105	7.4803	190	2.5625	65.09
222	4.3307	110	7.8740	200	2.7500	69.85
403	.6693	17	2.4409	62	1.1875	30.16
404	.7874	20	2.8346	72	1.3750	34.92
405	.9842	25	3.1496	80	1.3750	34.92
406	1.1811	30	3.5433	90	1.5625	39.69
407	1.3779	35	3.9370	100	1.7500	44.45
408	1.5748	40	4.3307	110	1.9375	49.21
409	1.7716	45	4.7244	120	2.1250	53.97
410	1.9685	50	5.1181	130	2.3125	58.74
411	2.1653	55	5.5118	140	2.5000	63.50
412	2.3622	60	5.9055	150	2.6875	68.26
413	2.5590	65	6.2992	160	2.6875	68.26
414	2.7559	70	7.0866	180	3.0625	77.79
416	3.1496	80	7.8740	200	3.2500	82.55
418	3.5433	90	8.8582	225	3.4375	87.31



# Regular Standard Timken Roller Bearings



The letters in above cuts are to be used in connection with table on opposite page.

Note—When speed, load and general application of bearings are given, The Timken Roller Bearing Axle Co., will recommend proper bearings to be used, in which case a two-year guarantee applies.

## DIMENSIONS AND CARRYING CAPACITIES OF TIMKEN ROLLER BEARINGS

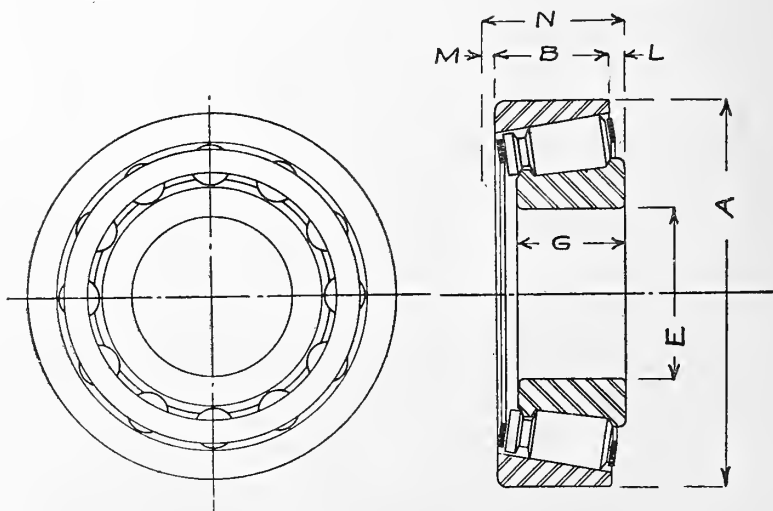
Cone Details				Name of Bearings				Cup Details				Clearance to be Provided at Rear of Cup	Cone Projection Out of Cup at Front	M	N	Over all Length without Dust Collar
K Inside Diameter Dust Collar Std.	Tapered Hole		Straight Hole	Cone	Load Carrying Capacity Pounds*	Roll		Cup	A Outside Ground Diameter	B Length	C Included Angle of Cup					
	Std. I	Std. F				Std. E	Name					Body Length Approx.	Body Diameter Approx.			
1 3/8	1 1/16	1 1/16	1 1/16	3-D	135	B	.52	.31	10-D	1.8025	20° 6'	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16
					200	B	.52	.31	9-D	2.240	24° 49'	1 1/16	1 1/16	1 1/16	1 1/16	
					270	F	.70	.37	10-E	2.240	17° 33'	1 1/16	1 1/16	1 1/16	1 1/16	
					3-E-A	270	F	.70	.37	10-E	2.240	17° 33'	1 1/16	1 1/16	1 1/16	1 1/16
1 1/2	1 1/16	1 1/16	2-E	335	F	.70	.37	9-E	2.615	20° 40'	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	
				3-F	335	F	.70	.37	10-F-A	2.4843	19° 14'	2 5/16	2 5/16	2 5/16	2 5/16	
				3-F-A	335	F	.70	.37	10-F-A	2.4843	19° 14'	2 5/16	2 5/16	2 5/16	2 5/16	
				2-F	400	F	.70	.37	9-F-A	3.000	22° 52'	2 5/16	2 5/16	2 5/16	2 5/16	
1 11/16	1 1/16	1 1/16	4-O	470	O	.84	.42	11-O	2.4375	21° 19'	1 3/4	1 3/4	1 3/4	1 3/4	1 3/4	
				520	O	.84	.42	10-O	2.8593	25° 0'	2 5/16	2 5/16	2 5/16	2 5/16		
				3-O-A	520	O	.84	.42	10-O	2.8593	25° 0'	2 5/16	2 5/16	2 5/16	2 5/16	
				2-O-A	575	O	.84	.42	9-O-A	3.125	27° 23'	2 5/16	2 5/16	2 5/16	2 5/16	
2 1/8	1 1/16	1 1/16	3-I	625	I	.84	.42	10-I-A	3.1562	20° 38'	2 5/16	2 5/16	2 5/16	2 5/16	2 5/16	
				3-I-A	625	I	.84	.42	10-I-A	3.1562	20° 38'	2 5/16	2 5/16	2 5/16	2 5/16	
				2-I	675	I	.84	.42	9-I	3.3125	23° 5'	2 5/16	2 5/16	2 5/16	2 5/16	
				2-K	725	I	.84	.42	9-I	3.6718	25° 26'	3	3	3	3	
2 3/8	1 1/16	1 1/16	3-J	830	I	.84	.42	9-K	4.4375	30° 0'	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	
				1,140	J	1.20	.49	10-J	3.4843	21° 28'	2 5/16	2 5/16	2 5/16	2 5/16		
				1,330	J	1.20	.49	9-J	3.4843	21° 28'	2 5/16	2 5/16	2 5/16	2 5/16		
				1,550	L	1.29	.54	10-L	3.9843	25° 12'	3 1/8	3 1/8	3 1/8	3 1/8		
2 1/2	1 1/16	1 1/16	3-L	1,935	L	1.29	.54	9-L	3.9843	22° 22'	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	
				2,065	L	1.29	.54	9-L	4.7343	26° 52'	3 1/8	3 1/8	3 1/8	3 1/8		
				3	L	1.29	.54	LL	5.596	30° 20'	4 1/8	4 1/8	4 1/8	4 1/8		
				3-N	3,680	N	1.59	.72	10-N-A	5.1875	24° 25'	4 1/8	4 1/8	4 1/8	4 1/8	
3 1/8	1 1/16	1 1/16	2-N	3,960	N	1.59	.72	9-N	5.8750	27° 8'	4 3/8	4 3/8	4 3/8	4 3/8	4 3/8	
				5,100	N	1.59	.72	9-N-A	6.3125	29° 53'	5 3/8	5 3/8	5 3/8	5 3/8		

\* The above loads are safe for speeds not exceeding 500 R. P. M. For speeds from 500 to 1,000 R. P. M. use 75 per cent. of the above rated loads. For speeds over 1,000 R. P. M. confer with Timken Roller Bearing Axle Co.

## DIMENSIONS AND CARRYING CAPACITIES TIMKEN NEW SERIES SHORT BEARINGS

New Series Bearing No.	Capacity in Lbs	E Dia. Hole in Cone, Inches	G Length of Cone, Inches	A Outside Dia. Cup, Inches	B Length of Cup, Inches	L Cone Stands out of Cup Inches	M Clearance at Rear of Cup, Inches	Equivalent Bearing in Regular Service
235	270	$1\frac{5}{16}$	$\frac{3}{4}$	2.2400	$1\frac{3}{16}$	$\frac{5}{32}$	$\frac{1}{16}$	3-E
236	"	1	"	"	"	"	"	"
255	335	$1\frac{1}{4}$	"	2.6150	"	"	"	2-E
256	"	$1\frac{5}{16}$	"	"	"	"	"	"
257	"	$1\frac{3}{8}$	"	"	"	"	"	" 0
275	400	$1\frac{3}{8}$	"	3.0000	$\frac{3}{4}$	"	$\frac{1}{8}$	2-F
276	"	$1\frac{9}{16}$	"	"	"	"	"	"
315	520	1	$\frac{7}{8}$	2.8593	$1\frac{5}{16}$	$\frac{1}{8}$	$\frac{1}{16}$	3-O:
316	"	$1\frac{3}{16}$	"	"	"	"	"	"
317	"	$1\frac{5}{16}$	"	"	"	"	"	"
335	625	$1\frac{5}{8}$	"	3.1562	"	"	"	3-I and 2-O-A
336	"	$1\frac{9}{8}$	"	"	"	"	"	"
337	"	$1\frac{7}{4}$	"	"	"	"	"	"
355	675	$1\frac{3}{4}$	"	3.3125	"	"	"	2 $\frac{1}{2}$ -I
375	725	2	"	3.6718	"	"	"	2-I
395	830	$2\frac{1}{2}$	"	4.4375	"	"	"	2-K
435	1140	$1\frac{3}{4}$	$1\frac{1}{8}$	3.4843	$1\frac{5}{16}$	$\frac{3}{16}$	"	3-J
455	1330	2	"	3.9843	"	"	"	2-J
456	"	$2\frac{1}{8}$	"	"	"	"	"	"

### New Series Short Bearings



Note.—1-32 inch radius at each end of cone is standard.

Total length required for bearing =  $N = M + B + L$ .

The above loads are safe for speeds not exceeding 590 R. P. M. For speeds from 500 to 1,000 R. P. M., use 75 per cent. of the above rated loads. For speeds over 1,000 R. P. M. confer with Timken Roller Bearing Axle Co.

## MELTING POINTS OF VARIOUS METALS

Aluminum . . . . .	1157 degrees F.	
Bronze . . . . .	1692	" "
Cast Iron (Gray) . . . . .	2012 to 2228	" "
" " (White) . . . . .	1922 to 2075	" "
Copper . . . . .	1929 to 1996	" "
Lead . . . . .	608 to 618	" "
Steel . . . . .	2372 to 2532	" "
Tin . . . . .	442 to 446	" "
Wrought Iron . . . . .	2732 to 2912	" "

## Strength of Automobile Steels

## SUMMARY OF TENSILE TESTS

Made with 2-inch Test Specimens of Carpenter Steel Co's. Auto Steels in accordance with the Standard Specifications of the American Society for Testing Materials

Grade	Elastic Limit in pounds per sq. inch	Tensile Strength in pounds per sq. inch	Elongation in Two inches	Reduction of Area	Condition
Chrome-Nickel Auto-Steel No. 5-317,	65,650	91,200	27.0%	64.3%	Natural
" " " "	210,000	315,000	5.0"	19.0"	Tempered
" " " "	185,400	269,200	6.0"	20.2"	"
" " " "	140,000	225,200	8.0"	30.2"	"
" " " "	114,000	130,500	19.0"	60.0"	Toughened
Chrome-Nickel Auto-Steel No. 3-317,	70,000	106,000	18.0"	45.0"	Natural
" " " "	135,000	197,000	9.0"	37.0"	Tempered
" " " "	90,000	110,000	25.0"	55.0"	Toughened
Dynamic Auto-Steel No. L3-14,	103,800	121,390	20.0"	60.0"	"
Special Nickel Steel No. 575,	80,000	99,000	21.0"	58.2"	"
" " " " No. 575,	87,000	102,000	21.0"	62.0"	"
Crucible Auto-Steel No. L-521,	160,000	175,000	7.0"	30.0"	Tempered
Special Auto-Steel No. 506,	70,000	113,950	22.0"	49.0"	Natural
" " " " No. 506,	71,200	105,600	24.0"	49.3"	"
Weldable Auto-Steel No. 492,	49,050	93,000	21.5"	35.0"	"
" " " " No. 492,	50,000	93,000	22.0"	37.0"	"
Auto-Steel No. 478,	48,300	74,500	29.0"	43.0"	"
" " " " No. 478,	46,500	77,500	28.0"	45.0"	"

No. 5-317. Suitable for transmission gears, counter-shafts and parts used for transmission of power.

No. 3-317. Mild-temper suitable for case hardened gears.

No. L 3-14. Axle-steel, to withstand alternating stresses and dynamic strains.

No. 575. Contains 3½ per cent. nickel and is manufactured to meet the U. S. Navy specification known as "High Grade."

No. L-521. Crucible gear-steel (moderate price) gears can be tempered and do not require hardening.

No. 506. Manganese steel for shafts, bolts, etc., not subjected to excessive alternating or recurrent stresses.

No. 492. Special straight-carbon crucible steel, with a fairly high tensile strength, suitable for axles and other parts that have to be welded.

No. 478. Special high-grade open-hearth steel, which is particularly adapted to such parts as are not subjected to unusual strains. It is suitable for axles, axle-journals, and various small parts of automobiles.

**BENDING TESTS**

Specimen Bars, 1 in. x 2 in. x 18 in. Distance between Supports, 12 inches: Load applied at centre of bar

No. 5-317	24,000	29,750
No. 5-317	23,620	29,000
No. 3-317	18,860	24,920
No. 3-317	19,000	25,130
No. 575	14,410	19,750
No. 575	13,490	18,090
No. 547	11,530	19,870
No. 506	11,500	20,690
No. 506	11,780	22,910
No. 492	8,792	16,150
No. 492	10,510	17,160
No. 478	6,510	11,800
No. 478	6,000	11,470

**DROP TESTS**

Made on notched bars. Specimen Bars, 12 in. x 1 in. x 1 in. Distance between supports, 6 in. Weight of tup, 230 pounds

No. 5-317	2.174	500	.35	5	2,500
No. 5-317	1.639	375	.30	50	18,750
No. 5-317	1.087	250	..	125	31,250
No. 3-317	2.174	500	.35	4	2,000
No. 3-317	1.087	250	.95	67	16,750
No. 575	2.174	500	.48	3	1,500
No. 575	1.087	250	1.10	33	8,250
No. 506	1.087	250	.10	3	750
No. 506	.543	125	.08	133	16,625
No. 478	2.174	500	..	1	500
No. 478	1.087	250	.23	2	500
No. 478	.543	125	.34	35	4,375

**COMPRESSION TESTS**

Specimens, 1 inch in Diameter and 1 inch High: Area .7854 square inch

No. 5-317	65,000	82,763	1.2%	....
No. 5-317	65,360	83,221	1.5%	10.0%
No. 3-317	47,000	59,852	....	....
No. 3-317	50,000	63,662	11.7%	22.0%
No. 575	45,000	57,293	8.5%	....
No. 575	46,000	58,568	8.4%	20.5%
No. 547	40,380	55,768	7.7%	14.2%
No. 506	60,640	77,208	0.3%	....
No. 506	67,040	95,358	0.4%	5.8%
No. 478	24,000	30,558	22.5%	....

As all the test-bars withstood more than one blow of 250 foot-pounds, the following comparison is noted:

No. 5-317	31,250	1,000
No. 3-317	16,750	532
No. 575	8,250	264
No. 506	750	24
No. 478	500	16

\*A foot-pound is the measure of force resulting from one pound falling a distance of one foot.

†The deflection before rupture is measured at the middle of the bar and is taken just before the blow is given that causes the bar to break.

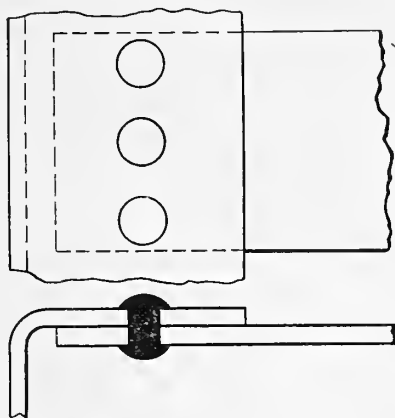
## Carbon and Alloy-steel

By far the most useful element that combines with the iron in the melting-pot to form steel is carbon. In connection with different percentages of silicon, manganese, nickel, chromium, tungsten and vanadium it imparts to the steel the valuable properties of hardness, strength and toughness in varied proportions, adapting it to meet the almost infinite variety of requirements demanded of tools made from crucible-steel. When none of these elements but silicon and manganese occur with the carbon in the steel, and then only in small proportions, usually below one per cent., it is customary to speak of the metal as "carbon-steel" or "straight-carbon steel," but when one or more of the other elements are present, and especially in larger proportions, considerably in excess of one per cent., the metal is called an "alloy-steel." These distinguishing terms have come more and more into fashion since the advent of high-speed tool-steel, which generally contains large percentages of chromium and tungsten, and also since the extensive introduction of nickel and chrome-nickel steels in modern automobile construction.

Each grade of straight-carbon tool-steel is usually made up in several different carbon-classes, distinguished from one another by containing different proportions of carbon, ranging all the way from 30 to 250 points—a "point" denoting one one-hundredth of one per cent. (0.01%) of the weight of the steel. The purpose of this wide range is to enable the manufacturer to supply, for any given use, steel of the particular carbon-content that has been found by experience most suitable for that use.

## THEORY OF RIVETED JOINTS WITH FORMULAE

The strength of riveted joints can only be determined by actual experiments on full sized specimens. The materials used, accuracy of the work, fit of the rivets in the holes, whether holes are punched or drilled, all effect the strength of the completed joint. However, the size and spacing of rivets, and thickness of plates may be determined by making the resistance of the joint to yielding equal in the various ways, in which it is possible for it to give way. A single riveted lap joint is shown, as being the one most commonly used in automobile construction. This may yield in one of



five ways: (1st) By crushing the plate in front of the rivet; (2nd) by shearing the rivet; (3rd) by tearing the plate between the rivet holes; (4th) by the rivet splitting the plate in front of it; (5th) by the rivet shearing out the plate in front of it.

Let  $p$  equal the pitch of rivets; i. e., the distance from center to center,  $d$  equal the diameter of the rivet;  $t$  the thickness of the plate;  $l$  the lap of the plate, i. e., distance from edge of plate to outer edge of rivet hole;  $U_s$  ultimate shearing strength of the plate;  $U_c$  ultimate crushing strength of the plate;  $U$  ultimate shearing strength of the rivet material and  $U_t$  the ultimate tensile strength of the plate.

The methods of giving way can be represented as follows:

- (1) Resistance of plate in front of rivet to crushing  $= U_c t d$ .
- (2) Resistance of one rivet to shearing  $= U \left( \frac{\pi d^2}{4} \right)$ .
- (3) Resistance to tearing of plate between two rivet holes  $= U_t t (P - d)$ .
- (4) Resistance of plate to being split out  $= C \left( \frac{t l^2}{d} \right)$

in which  $C$  is an empiracle constant depending on the plate material. An average value for  $C$ , when dimensions are in inches is given by Robert Wilson as 100,000 lbs.

- (5) Resistance of plate in front of rivet to shearing  $= 2 U_s \left( l + \frac{d}{2} \right) t$ .

Assuming a known plate thickness, we have by making (1) equal to (2)

$$U_c t d = U \left( \frac{\pi d^2}{4} \right) \quad \therefore d = \frac{4 t U_c}{\pi U}$$

which determines the diameter of the rivet.

$$\text{Equating (2) and (3) we have } \frac{U \pi d^2}{4} = U_t t (P - d) \quad \therefore P = d + \frac{U \pi d^2}{U_t 4t}$$

which gives the pitch of the rivets, in terms of the diameter of the rivet and thickness of the plate.

$$\text{Equating (4) and (1) we have } C \left( \frac{t l^2}{d} \right) = U_c t d \quad \therefore l = d \sqrt{\frac{U_c}{C}}$$

which gives the lap of the plate in order that it may not split out in front of the rivet.

$$\text{By equating (5) and (1) we have } 2 U_s \left( l + \frac{d}{2} \right) t = U_c t d \quad \therefore l = \frac{d}{2} \left( \frac{U_c}{U_s} - 1 \right)$$

the lap necessary that the plate may not shear out in front of the rivet.

## Useful Information When Testing.

**Stresses** are the forces which are applied to bodies to bring into action their elastic and cohesive properties. These forces cause alterations of the forms of the bodies upon which they act.

**Strain** is a name given to the kind of alterations produced in the body by the stresses. Distinction between Stress and Strain is not always observed, one being used for the other. (Wood.)

Stresses are of different kinds—tensile, compressive, transverse, torsional and shearing.

**Elastic Limit** is the point at which stress ceases to be sensibly proportional to strain. (Bauschinger.)

**Modulus of Elasticity** is the ratio of the stress per unit area to the strain.

The first permanent set becomes visible at the elastic limit of the piece.

When rolled bars are subjected to alternate tension and compression stresses the limit in tension is lowered and in compression raised, until both correspond to equal loads.

**Factor of Safety** is the ratio in which the load that is just sufficient to overcome instantly the strength of a piece, is greater than the greatest safe ordinary working load. (Rankine.)

Factors of safety in structures subject to shocks should not be less than 10 and in some places as high as 40.

## English and Metric Speed Equivalents.

To obtain velocity in feet per second multiply the speed in miles per hour by 1.466 +  
Velocity ft. per sec. = (Miles per hour)  $\times$  1.466 +

One mi. per hour = 1.466 ft. per second = 88 ft. per minute = 0.463 metres per second = 27.8 metres per minute.

1 Km. per hour = 0.914 metres per second = 54.9 ft. per minute = 0.624 mi. per hour.

## TIME PER MILE EXPRESSED IN MILES PER HOUR

Time for one mile			Miles Per hour	Time for one mile			Miles Per hour	Time for one mile			Miles Per hour
Min.	Sec.			Min.	Sec.			Min.	Sec.		
1	0	=	60.00	1	27	=	41.38	1	54	=	31.58
1	1	=	59.00	1	28	=	40.91	1	55	=	31.30
1	2	=	58.06	1	29	=	40.45	1	56	=	31.03
1	3	=	57.14	1	30	=	40.00	1	57	=	30.77
1	4	=	56.25	1	31	=	39.56	1	58	=	30.50
1	5	=	55.38	1	32	=	39.13	1	59	=	30.25
1	6	=	54.54	1	33	=	38.71	2	0	=	30.00
1	7	=	53.73	1	34	=	38.29	2	3	=	29.26
1	8	=	52.94	1	35	=	37.89	2	6	=	28.57
1	9	=	52.17	1	36	=	37.50	2	9	=	27.90
1	10	=	51.42	1	37	=	37.11	2	12	=	27.27
1	11	=	50.70	1	38	=	36.73	2	15	=	26.66
1	12	=	50.00	1	39	=	36.36	2	18	=	26.08
1	13	=	49.31	1	40	=	36.00	2	21	=	25.53
1	14	=	48.65	1	41	=	35.64	2	24	=	25.00
1	15	=	48.00	1	42	=	35.29	2	27	=	24.49
1	16	=	47.37	1	43	=	34.95	2	30	=	24.00
1	17	=	46.75	1	44	=	34.61	2	33	=	23.53
1	18	=	46.15	1	45	=	34.28	2	36	=	23.07
1	19	=	45.57	1	46	=	33.96	2	39	=	22.64
1	20	=	45.00	1	47	=	33.64	2	42	=	22.22
1	21	=	44.44	1	48	=	33.33	2	45	=	21.81
1	22	=	43.90	1	49	=	33.03	2	48	=	21.42
1	23	=	43.37	1	50	=	32.72	2	51	=	21.05
1	24	=	42.85	1	51	=	32.43	2	54	=	20.69
1	25	=	42.35	1	52	=	32.14	3	0	=	20.00
1	26	=	41.86	1	53	=	31.86	..	..	=	....

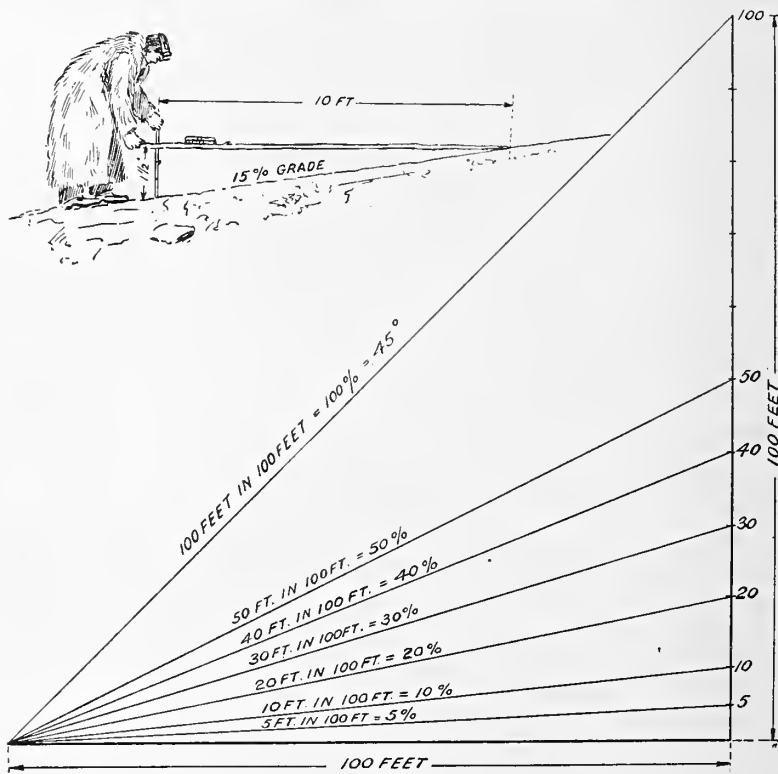


## EQUIVALENT VALUES OF ELECTRICAL AND MECHANICAL UNITS

By H. WARD LEONARD, Ward Leonard Electric Co.

Unit.	Equivalent Value in other Units	Unit.	Equivalent Value in other Units.
One K. W. Hour =	1,000. watt hours. 1.34 H. P. hours. 2,654,200. ft.-lbs. 3,600,000. joules. 3,412. heat-units. 367,000. kilogram meters. .235 lb. carbon oxidized with perfect efficiency. 3.53 lbs. water evap. from and at 212° F. 22.75 lbs. of water raised from 62° to 212° F.	One Watt =	1. joule per second. .00134 H.-P. 3.412 heat-units per hour. .7373 ft.-lb. per second. .0035 lb. water evap. per hour from and at 212° F. 44.24 ft.-lbs. per minute. 1. lb. pull at half a mile per hour (approx.).
One H.-P. Hour =	.746 K. W. hours. 1,980,000. ft.-lbs. 2,545. heat-units. 273,740. kg. m. .175 lb. carbon oxidized with perfect efficiency. 2.64 lbs. water evap. from and at 212° F. 17.0 lbs. water raised from 62° F. to 212° F.	One Watt per Sq. In. =	8.19 heat-units per sq. ft. per minute. 6371. ft.-lbs. per sq. ft. per minute. .193 H.-P. per sq. ft.
One Kilo- Watt =	1,000. watts. 1.34 horse-power. 2,654,200. ft.-lbs. per hour. 44,240. ft.-lbs. per minute. 737.3 feet-lbs. per second. 3,412. heat-units per hour. 56.9 heat-units per minute. .948 heat-unit per second. 2.275 lb. carbon oxidized per hour. 3.53 lbs. water evap. per hour from and at 212° F.	One Heat Unit =	1,055. watt seconds. 778. ft.-lbs. 107.6 kilogram meters. .000293 K. W. hour. .000393 H.-P. hour. .0000688 lb. carbon oxidized. .001036 lb. water evap. from and at 212° F.
One H.-P. =	746. watts. .746 K. W. 33,000. ft.-lbs. per minute. 550. ft.-lbs. per second. 2,545. heat-units per hour. 42.4 heat-units per minute. .707 heat-units per second. .175 lb. carbon oxidized per hour. 2.64 lbs. of water evap. per hour from and at 212° F.	One Heat-Unit per Sq. Ft. per min. =	.122 watts per sq. in. .0176 K. W. per sq. ft. .0236 H.-P. per sq. ft.
One Joule =	1. watt second. .000000278 K. W. hour. .102 kg. m. .0009177 heat-units. .7373 ft.-lb.	One Kilogram meter =	7.233 ft.-lbs. .00000365 H.-P. hour. .00000272 K. W. hour. .0093 heat-units.
One Ft.-lb. =	1.356 joules. .1383 kg. m. .000000377 K. W. hours. .001285 heat-units. .0000005 H.-P. hour.	One lb. carbon oxidized with perfect efficiency =	14,544. heat-units. 1.11 lb. anthracite coal oxidized. 2.5 lbs. dry wood oxidized. 21. cu. ft. illuminating gas. 4.26 K. W. hours. 5.71 H.-P. hours. 11,315,000. ft.-lbs. 15. lbs. of water evap. from and at 212° F.
		One lb. water evap., from and at 212° F. =	.283 K. W. hour. .379 H.-P. hour. 965.7 heat-units. 103,900 kg. m. 1,019,000. joules. 751,300. ft.-lbs. .0664 lb. of carbon oxidized.

## MEASUREMENT OF GRADES



## MEASUREMENTS OF GRADES IN PER CENT.

The inclination of a road surface is usually spoken of as a grade of 5, 10, 15%, etc. As in any other case, per cent. simply means so many in a hundred, or in other words the number of feet vertical rise or fall in 100 feet measured in a horizontal direction, determines the per cent. of the grade as shown in the accompanying drawing. A rise of 5 feet in 100, the base of the triangles being 100 feet is 5%, a rise of 10 feet, 10%, etc. It will be noticed that although there is a definite relation between angles and the per cent. of grade, these are two very separate and distinct quantities. A 20% grade being only an angle of about 11 degrees, these equivalent angles being given in the table on the following page. Thus a rise of 100 feet in 100 or a 100% grade is only an angle of 45 degrees, and not an angle of 90 degrees or perpendicular as it is sometimes considered.

## HOW TO ASCERTAIN THE GRADE WITHOUT A GRADOMETER

A method of determining the percentage of a grade on any road without any special instruments is here given and illustrated. All that is required is to measure off ten feet on any convenient stick and rest one end as shown in the sketch above, upon the surface of the road being careful to keep the stick horizontal. This can be done by using a spirit level or an ordinary bottle filled with water allowing a bubble in the well-known manner. Measure from the end of the stick to the road surface and multiply by 10 which will give the per cent. of the grade. The average of several such measurements will give fairly accurate results.

## GRADIENTS IN PER CENT. AND DEGREES

Per Cent.	GRADE		Equal to Angle of	Rise or Fall in One Mile Feet
	Units			
2.5	1 in	40	1° 26'	132
2.8	1 "	35	1° 38'	151
3.3	1 "	30	1° 55'	155
4	1 "	25	2° 18'	218
5	1 "	20	2° 52'	204
5.5	1 "	18	3° 11'	293
5.8	1 "	17	3° 22'	310
6.25	1 "	16	3° 35'	330
6.66	1 "	15	3° 49'	352
7.1	1 "	14	4° 05'	337
7.69	1 "	13	4° 24'	406
8.3	1 "	12	4° 46'	440
9	1 "	11	5° 11'	480
10	1 "	10	5° 43'	528
11.1	1 "	9	6° 17'	586
12.5	1 "	8	7° 08'	635
14.3	1 "	7	8° 09'	754
16.6	1 "	6	9° 26'	880
20	1 "	5	11° 19'	1056

## METRIC TIRE SIZES AND THEIR AMERICAN EQUIVALENTS

Metric Sizes	*Approximate Size in Inches	Metric Sizes	*Approximate Size in Inches
650 x 65	26 x 2 $\frac{1}{2}$	870 x 90	34 x 3 $\frac{1}{2}$
700 x 65	28 x 2 $\frac{1}{2}$	910 x 90	36 x 3 $\frac{1}{2}$
750 x 65	30 x 2 $\frac{1}{2}$	960 x 90	38 x 3 $\frac{1}{2}$
800 x 65	32 x 2 $\frac{1}{2}$	1010 x 90	40 x 3 $\frac{1}{2}$
830 x 65	33 x 2 $\frac{1}{2}$	815 x 105	32 x 4
860 x 65	34 x 2 $\frac{1}{2}$	875 x 105	34 x 4
700 x 85	28 x 3 $\frac{1}{4}$	915 x 105	36 x 4
750 x 85	30 x 3 $\frac{1}{4}$	820 x 120	32 x 4 $\frac{1}{2}$ -5
800 x 85	32 x 3 $\frac{1}{4}$	850 x 120	33 x 4 $\frac{1}{2}$ -5
860 x 85	34 x 3 $\frac{1}{4}$	880 x 120	34 x 4 $\frac{1}{2}$ -5
760 x 90	30 x 3 $\frac{1}{2}$	920 x 120	36 x 4 $\frac{1}{2}$ -5
810 x 90	32 x 3 $\frac{1}{2}$	1020 x 120	40 x 4 $\frac{1}{2}$ -5
840 x 90	32 x 3 $\frac{1}{2}$	1080 x 120	42 x 4 $\frac{1}{2}$ -5

\*The actual sizes of metric tires are not exactly the same as any American tires.

## MAXIMUM CARRYING CAPACITIES OF SOLID TIRES

2"	500 lbs.
2 $\frac{1}{2}$ "	750 lbs.
3"	950 lbs.
3 $\frac{1}{2}$ "	1375 lbs.
4"	1950 lbs.
5"	2475 lbs.
6"	3500 lbs.

## DUAL TYPE

3 $\frac{1}{2}$ "	4000 lbs.
4"	6000 lbs.

AIR PRESSURES FOR INFLATING PNEUMATIC TIRES  
RECOMMENDED BY LEADING MAKERS

Diameter of Tire, Inches	Maximum Weight on Wheel, lbs.	Air Pressure in Tire, lbs. per Square Inch
2 $\frac{1}{2}$	225	50
3	350	60
3 $\frac{1}{2}$	600	70
4	750	80
4 $\frac{1}{2}$	1,000	90
5	1,000	90

**CARRYING CAPACITY PER WHEEL OF STANDARD SIZED TIRES**

For weights in excess of 1,000 pounds per wheel, 5-inch tires or larger are recommended.

2½-inch tires, all diameters.....	225 pounds
3- inch tires, all diameters.....	350 "
3½ x 28-inch tires.....	400 "
3½ x 30-inch tires.....	450 "
3½ x 32-inch tires.....	555 "
3½ x 34-inch tires.....	600 "
3½ x 36-inch tires.....	600 "
4 x 30-inch tires.....	550 "
4 x 32-inch tires.....	650 "
4 x 34-inch tires.....	700 "
4 x 36-inch tires.....	750 "
4½ x 32-inch tires.....	700 "
4½ x 34-inch tires.....	800 "
4½ x 36-inch tires.....	900 "

**CLINCHER RIM MEASUREMENTS**

Size	Inside Diam. of Rims for Wood Wheels	Diam. of Rim at Tire Seat for Wood and Wire Wheels	Size	Inside Diam. of Rims for Wood Wheels	Diam. of Rim at Tire Seat for Wood and Wire Wheels
26 x 2½	20.834"	21	34 x 3	27¾"	28
28 x 2½	21.834"	22	36 x 3	29¾"	30
30 x 2½	23.834"	24	28 x 3½	20¼"	21
32 x 2½	26.834"	27	30 x 3½	22¼"	23
34 x 2½	28.834"	29	32 x 3½	24¼"	25
36 x 2½	30.834"	31	34 x 3½	26¼"	27
26 x 3	19.834"	20	36 x 3½	28¼"	29
28 x 3	21.834"	22	30 x 4	21¼"	22
30 x 3	23.834"	24	32 x 4	23¼"	24
32 x 3	25.834"	26	34 x 4	25¼"	26
34 x 3	27.834"	28	36 x 4	27¼"	28
36 x 3	29.834"	30	28 x 4½	18¾"	19
26 x 2½	20¾"	21	30 x 4½	20¾"	21
28 x 2½	21¾"	22	32 x 4½	22¾"	23
30 x 2½	23¾"	24	34 x 4½	24¾"	25
32 x 2½	26¾"	27	36 x 4½	26¾"	27
34 x 2½	28¾"	29	28 x 5	17¾"	18
36 x 2½	30¾"	31	30 x 5	19¾"	20
26 x 3	19¾"	20	32 x 5	21¾"	22
28 x 3	21¾"	22	34 x 5	23¾"	24
30 x 3	23¾"	24	36 x 5	25¾"	26
32 x 3	25¾"	26	40 x 5	29¾"	30

Note that the 28 and 30 x 2½ Tires are made interchangeable with the 28 and 30 x 3 Tires

**PERCENTAGE OF SLIP OF MOTOR CAR DRIVING WHEELS**

From Mr. Henry Souther's analysis of the results of tests on tire slips at Brooklands, England, on a level racing track of the best sort, with plain round tread tires inflated as is usual for racing, the percentage of slip of the rear wheels when driving is given in the following table:

0.3 for a speed of 40 miles per hour					
.6	"	"	50	"	"
1.1	"	"	60	"	"
1.8	"	"	70	"	"
3.7	"	"	80	"	"
5.4	"	"	90	"	"

The driving wheel on the inside, running around a curved track, slips a very little more than the outer wheel as the centrifugal force going around curves reduces the weight on the inner wheel permitting it to slip more readily than the outer wheel.

MONEY CONVERSION TABLES

English	U. S.	U. S.	English
1 Farthing .....	\$ .0051	\$ .01 .....	1.96 Farthings
1 Penny .....	.0203	.01 .....	.492 Pence
6 Pence .....	.1217	.25 .....	12.3 “
1 Shilling .....	.2433	.25 .....	1.0275 Shillings
20 Shillings .....	4.8665	1.00 .....	4.11 “
1 Pound .....	4.8665	1.00 .....	.2055 Pounds
5 Pounds .....	24.3325	5.00 .....	1.0275 “
<hr/>			
French	U. S.	U. S.	French
1 Centime .....	\$ .00193	\$ .01 .....	5.1813 Centimes
10 Centimes .....	.0193	.10 .....	51.813 “
100 “ .....	.193	1.00 .....	5.1813 Francs
1 Franc .....	.193	10.00 .....	51.813 “
10 Francs .....	1.93		
<hr/>			
German	U. S.	U. S.	German
1 Pfennig .....	\$ .00238	\$ .01 .....	4.201 Pfennigs
25 Pfennigs .....	.0595	.25 .....	1.05025 Marks
100 “ .....	.238	1.00 .....	4.201 “
1 Mark .....	.238	10.00 .....	42.01 “
10 Marks .....	2.38		

CAPACITY OF CYLINDERS

Number of gallons for one foot depth

When diameter is given in feet == (square of diameter) x 5.873  
When diameter is given in inches == (square of diameter) x 0.0408

Table of Capacities of Cylindrical Tanks in Liquid Gallons (Approximate)

1	2	3	4	5	6	7	8	9	10	Gallons	Gals. per inch
5 x 12	6 x 18 7 x 12	6 x 24	6 x 36	6 x 42						6" dia.	.122
		7 x 18	7 x 24	7 x 30	7 x 36	7 x 42	7 x 48			7" "	.165
		8 x 15	8 x 18	8 x 24	8 x 30	8 x 36	8 x 42	8 x 45	8 x 48	8" "	.217
		9 x 12	9 x 15	9 x 18	9 x 24	9 x 30	9 x 34	9 x 36	9 x 40	9" "	.275
					10 x 20	10 x 24	10 x 26	10 x 28	10 x 32	10" "	.340
						12 x 16	12 x 18	12 x 20	12 x 24	12" "	.486
10	15	20	25	30	35	40	45	50	Gallons	Gal. per inch	
10 x 32	10 x 48									10" dia.	.340
12 x 24	12 x 34	12 x 42	12 x 50	12 x 60						12" "	.486
14 x 18	14 x 24	14 x 30	14 x 38	14 x 44	14 x 52	14 x 60				14" "	.666
	16 x 18	16 x 24	16 x 30	16 x 36	16 x 42	16 x 48	16 x 54	16 x 60		16" "	.870

# Association of Licensed Automobile Manufacturers

## Standard for Hexagon Head Screws, Castle and Plain Nuts

The present United States standards for Bolts, Nuts and Screw-threads were established by the United States Navy Department in May, 1868. These standards remained pre-eminent for many years and have proved of great convenience and value. During recent years, however, manufacturers of fine machinery have found from experience that for a large portion of their work the United States standards for pitch of threads have been too coarse, and the dimensions of heads and nuts too large. In order to secure satisfactory construction special fine pitch screw-threads and smaller nuts have had to be made. The number and variety of these special threads and nuts have finally become such that great confusion, inconvenience and expense have been caused. To overcome this condition the Association of Licensed Automobile Manufacturers has adopted a new Screw Standard which is herewith set forth.

It is assumed that where screws are to be used in soft material, such as cast-iron, brass, bronze or aluminum, the existing United States standard pitches will be used.

### The A. L. A. M. Standard.

This standard is to be known as "Association of Licensed Automobile Manufacturers' Standard for Hexagon Screws, Castle and Plain Nuts."

The term "Screw" is intended to supplant the present so-called "coupling-bolt" and "cap-screw." The term "Plain Hexagon Nut" is intended to supplant the present so-called "United States Standard Nut." The term "Castle Nut" is given to a new nut, which is intended to be used where a positive locking system is desired. The term "Facing" is given to a relieved portion under the screw heads, castle nuts and plain nuts.

### DRAWINGS AND DETAILED DIMENSIONS OF A. L. A. M. STANDARD SCREWS AND NUTS

#### MATERIALS

A better material than ordinarily used for screws is deemed necessary. The selection of a better material depends to a considerable extent upon the possibility of commercially machining it in screw machines. Such material has been found in several qualities of steel, having a tensile strength of not less than one hundred thousand (100,000 lb.) pounds per square inch, and an elastic limit of sixty thousand (60,000 lb.) pounds per square inch, as compared with fifty or sixty thousand (50,000 or 60,000 lb.) pounds per square inch tensile strength and thirty-five thousand (35,000 lb.) pounds per square inch elastic limit now in common use.

The Screws and Nuts described in this Standard are to be made of this better material. Screws are to be left soft. Screw Heads are to be left soft. The Plain Nuts are to be left soft. The Castle Nuts are to be case-hardened.

#### TOLERANCE

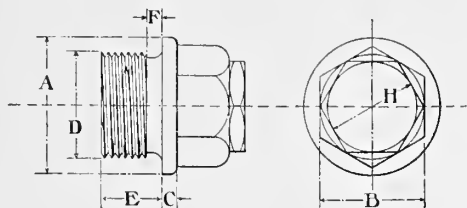
The body diameter of the screws shall be one-thousandth (.001") inch less than the nominal diameter, with a plus tolerance of zero and a minus tolerance of two-thousandths (.002") inch.

The nuts shall be a good fit, without perceptible shake.

The clearance between tops of threads and bottoms of threads in nuts shall be that existing in the present practice of machine screw makers; that is, the tap shall be between two-thousandths (.002") inch and three-thousandths (.003") inch large.

**A. L. A. M. STANDARD SPARK PLUG**

The spark plug adopted as a standard has a  $\frac{7}{8}$  inch diameter, straight thread, 18 pitch, and the design and dimensions shown in the following drawing and specifications:



$A = 1\frac{1}{8}$ ",  $B = \frac{7}{8}$ ",  $C = \frac{1}{8}$ ",  $D = \frac{7}{8}$ ",  $E = \frac{1}{2}$ " (Min.),  $F = \frac{1}{8}$ " (Max.) Depth of recess, not over depth of thread.  $H = \frac{3}{4}$ ".

**SPECIFICATIONS**

**STOCK**— $1\frac{1}{8}$  inch round.

**HEAD FORM**—Milled hex.

Short Diameter— $\frac{7}{8}$  inch.

**FLANGE—FORM**—Circular.

Diameter— $1\frac{1}{8}$  inch.

Thickness— $\frac{1}{8}$  inch.

Face—Annular seat  $\frac{1}{8}$  inch wide (suitable for McKim type copper-asbestos Gasket.)

**BLANK FOR THREAD**—Diameter— $\frac{7}{8}$  inch.

Length—Not less than  $\frac{1}{2}$  inch.

**RECESS ADJACENT TO FLANGE**—Width—not over  $\frac{1}{8}$  inch.

Depth—Not over depth of thread.

**THREAD**—Diameter— $\frac{7}{8}$  inch straight.

Pitch—18.

Form—U. S. Standard.

Cut—Perfect into recess.

**PACKING-GLAND NUT HEAD**—Form—Hexagonal.

Short Diameter— $\frac{3}{4}$  inch.

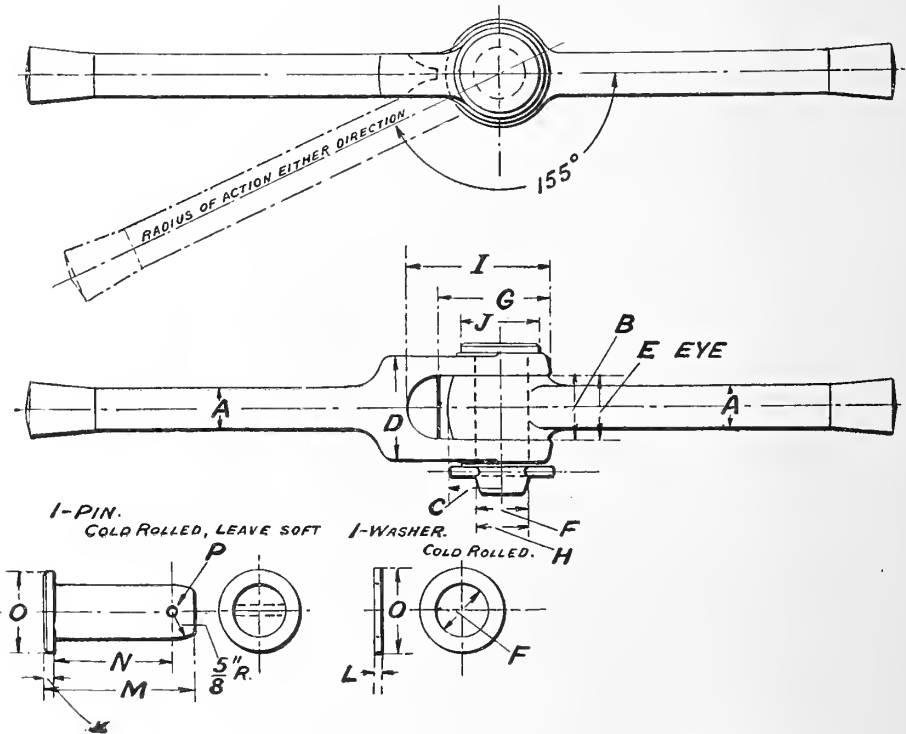
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A L. A. M. STANDARD SOLID YOKE AND EYE ROD END

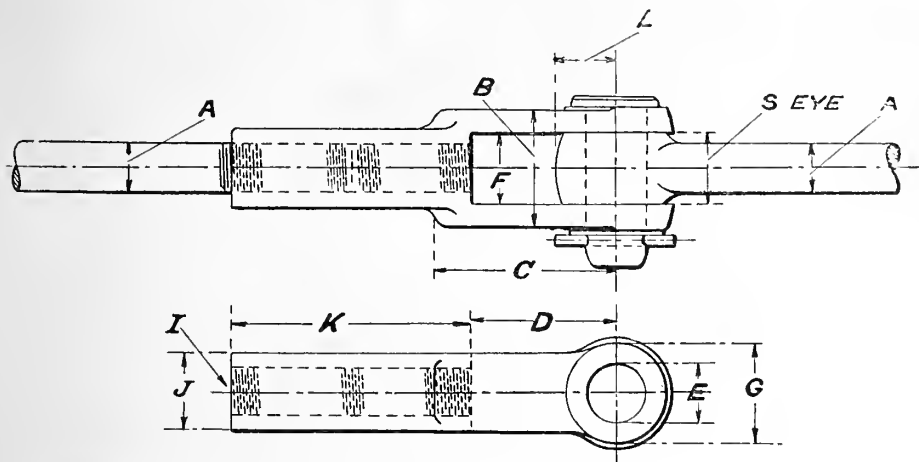
No. 5 A. L. A. M. Steel



A	1 1/4	5 1/16	3 5/8	7 1/16	1 1/2
B	1 7/16	1 1/2	1 3/2	1 3/2	1 3/2
C	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
D	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
E	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
F	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
G	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
H	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
I	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
J	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
K	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
L	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
M	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
N	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
O	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2
P	1 3/8	1 7/16	1 1/2	1 3/2	1 3/2

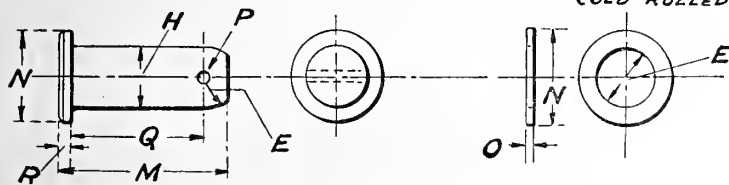
# A. L. A. M. STANDARD ADJUSTABLE YOKE AND EYE-ROD END

No. 5 A. L. A. M. Steel



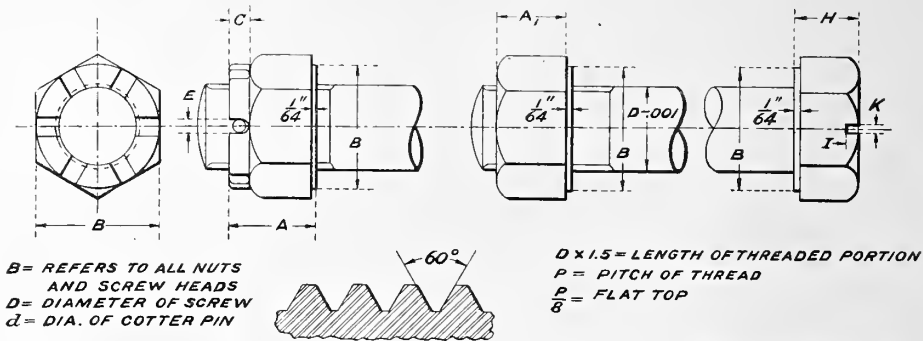
I-PIN.  
COLD ROLLED, LEAVE SOFT

I-WASHER  
COLD ROLLED



A	1.43	1.56	3.8	7.16	1.2
B	1.43	1.56	1.7	1.8	1.14
C	1.14	1.33	1.2	1.14	1.14
D	1	1.8	1.4	1.8	1.14
E	1.5	1.32	1.5	1.6	1.14
F	1.6	1.9	1.6	2.1	1.14
G	1.1	1.4	1.7	1.5	1.14
H	1.1	1.4	1.8	1.6	1.14
I	.310	.403	.465	.559	.621
J	A-28	A-24	A-24	A-20	A-20
K	1.2	1.3	1.6	2.1	2.1
L	1.3	1.6	1.7	1.7	1.6
M	1.3	1.6	1.7	1.7	1.6
N	1.3	1.6	1.7	1.7	1.6
O	1.3	1.6	1.7	1.7	1.6
P	1.3	1.6	1.7	1.7	1.6
Q	1.3	1.6	1.7	1.7	1.6
R	1.3	1.6	1.7	1.7	1.6
S	.432	.495	.588	.651	.745

# A. L. A. M. Standard Bolt and Nut



<b>A</b>	$\frac{9}{32}$	$\frac{21}{64}$	$\frac{13}{32}$	$\frac{29}{64}$	$\frac{9}{16}$	$\frac{39}{64}$	$\frac{23}{32}$	$\frac{49}{64}$	$\frac{13}{16}$	$\frac{29}{32}$	<b>1</b>
<b>A<sub>1</sub></b>	$\frac{7}{32}$	$\frac{17}{64}$	$\frac{21}{64}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{31}{64}$	$\frac{35}{64}$	$\frac{19}{32}$	$\frac{21}{32}$	$\frac{49}{64}$	$\frac{7}{8}$
<b>B</b>	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{15}{16}$	<b>1</b>	$\frac{11}{8}$	$\frac{11}{4}$	$\frac{17}{8}$
<b>C</b>	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
<b>D</b>	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	<b>1</b>
<b>d</b>	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
<b>E</b>	$\frac{5}{64}$	$\frac{5}{64}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{5}{32}$	$\frac{5}{32}$	$\frac{5}{32}$	$\frac{5}{32}$	$\frac{5}{32}$
<b>H</b>	$\frac{3}{16}$	$\frac{15}{64}$	$\frac{9}{32}$	$\frac{21}{64}$	$\frac{3}{8}$	$\frac{27}{64}$	$\frac{15}{32}$	$\frac{33}{64}$	$\frac{9}{16}$	$\frac{21}{32}$	$\frac{3}{4}$
<b>I</b>	$\frac{3}{32}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
<b>K</b>	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
<b>P</b>	28	24	24	20	20	18	18	16	16	14	14

## SECTION IX

# Automobile Insurance, Accident, Life and Indemnity, with Sample Policy

## Summary of Provisions of Usual Policies Issued to Automobilists Covering Indemnity, Accident and Death

We herewith give some of the principal provisions of the Automobile Liability Policy of the Travelers' Insurance Co., of Hartford, Conn., which is believed to be typical of this class of insurance.

A property damage certificate also accompanies this policy, which indemnifies the assured against loss on account of injury to any one or destruction of other people's property resulting from an accident due to the ownership or use of an automobile.

A Travelers' Automobile Liability Policy covers legal liability for damages for personal injuries caused by the ownership, maintenance or use of the automobile (while driven by any person not under sixteen years of age). Suits for damages may be the result of numberless mishaps such as the unexpected acts of pedestrians, bicyclists, or children who may dart in front of the car, skidding, collisions, the breaking of steering gear or the frightening of horses, which running away may injure or kill the occupants of the vehicle or others using the highways.

Under its policy the company on receipt of notice of accident makes an investigation and in case of probable liability proceeds to make a settlement at its expense without litigation. Should a suit for damages follow, the company defends the action, defrays all court costs and expenses, and pays within the limits of the policy any damages that may be awarded.

Policies are usually written for limits of \$5,000 for injuries or death of one person. \$10,000 for one accident causing injuries or death of more than one person.

These limits may be increased if desired, and the policy does not lapse when these limits have been expended but continues the undertaking to pay within such limits upon every other accident that may occur while the policy is in force.

#### **SAMPLE AUTOMOBILE POLICY**

##### **The Travelers' Insurance Company, of Hartford, Connecticut,**

(Herein called the Company) Does hereby agree with the assured, named and described as such in the declarations forming part hereof, as respects bodily injuries accidentally sustained, including death at any time resulting therefrom as follows:

##### **Indemnity for Loss.**

I. To Indemnify the Assured against loss by reason of the liability imposed upon him by law for damages on account of such injuries.

##### **Service.**

II. To Serve the Assured upon notice of such injuries by such investigation thereof, or by such negotiation or settlement of any resulting claims as may be deemed expedient by the Company.

##### **Defense.**

III. To Defend in the name and on behalf of the Assured any suits which may at any time be brought against him on account of such injuries, including suits alleging such injuries and demanding damages therefor although such suits, allegations or demands are wholly groundless, false or fraudulent.

##### **Expenses.**

IV. To Pay all costs taxed against the Assured in any legal proceeding defended by the Company, all interest accruing after entry of judgment upon such part thereof as shall not be in excess of the limits of the Company's liability as hereinafter expressed, all expenses incurred by the Company for investigation, negotiation or defense, and the expense incurred by the Assured for such immediate surgical relief as shall be imperative at the time any such injury is sustained.

##### **Persons Covered.**

V. This agreement shall apply to such injuries sustained by any person or persons.

##### **Operations Covered.**

VI. This agreement shall apply only to such injuries so sustained by reason of the ownership or maintenance of any of the automobiles enumerated and described in said Declarations and the use of such automobiles for the purposes specified in item 3 thereof. If such specified use is for private or pleasure purposes it shall include ordinary business purposes except the carriage of passengers for a consideration, express or implied, or demonstrating or testing, or the transportation or delivery of material or merchandise. If such specified use is as a commercial vehicle (meaning thereby an automobile used for transportation and delivery of material or merchandise) it shall include the loading and unloading of goods carried on any such automobile. This agreement shall not apply while any such automobile is driven or manipulated in any race or competitive speed test, or by any person under the age of sixteen years.

##### **Location Covered.**

VII. This agreement shall apply only to such injuries so sustained while within the limits of the United States of America or the Dominion of Canada.

##### **Policy Period.**

VIII. This agreement shall apply only to such injuries so sustained by reason of accidents occurring within the Policy Period as limited and defined in item 2 of said Declarations.

##### **Limits of Indemnity.**

IX. The Company's liability for the Indemnity provided in Paragraph I. foregoing, for an accident resulting in such injuries so sustained is limited to the amounts and as expressed in item 4 of said Declarations, which limits shall apply to each automobile covered hereby.

#### **CONDITIONS**

##### **Premium, Computation, Cancellation.**

The Premium includes a charge for each automobile dependent upon its description and the purposes for which it is to be used.

This Policy may be canceled at any time by either of the parties upon written notice to the other party stating when thereafter cancellation shall be effective, and the date of cancellation shall then be the end of the Policy Period. If such cancellation is at the

Company's request the earned premium shall be computed and adjusted pro rata. If such cancellation is at the Assured's request, the earned premium shall be computed and adjusted at short rates in accordance with the table printed hereon. Notice of cancellation mailed to the address of the Assured herein given shall be a sufficient notice and the check of the Company, similarly mailed, a sufficient tender of any unearned premium.

#### **Inspection.**

The Company shall be permitted, at all reasonable times during the Policy Period, to inspect any of the automobiles covered by this Policy.

#### **Notice.**

The Assured upon the occurrence of an accident, shall give immediate written notice thereof to the Company, or to its duly authorized Agent, with the fullest information obtainable. He shall give like notice with full particulars of any claim made on account of such accident. If, thereafter, any suit is brought against the Assured he shall immediately forward to the Company every summons or other process served upon him. The Assured, when requested by the Company shall aid in effecting settlements, securing evidence, the attendance of witnesses and in prosecuting appeals. The Assured shall not voluntarily assume any liability, settle any claim or incur any expense, except at his own cost, or interfere in any negotiation for settlement or legal proceeding without the consent of the Company previously given in writing.

#### **Recovery.**

No action shall lie against the Company to recover for any loss under Paragraph I. foregoing, unless it shall be brought by the Assured for loss actually sustained and paid by him in money in satisfaction of a judgment after trial of the issue, and no such action shall lie to recover under any other agreement of the Company herein contained unless brought by the Assured himself to recover money actually expended by him. In no event shall any such action lie unless brought within ninety days after the right of action accrues as herein provided.

#### **Special Statutes.**

If the limitation of time for notice of accident or for any legal proceeding herein contained is at variance with any specific statutory provision in relation thereto, in force in the state in which the business operations herein described are conducted, such specific statutory provision shall supersede any such condition in this contract inconsistent therewith.

#### **Assignment.**

No assignment of interest under this Policy shall bind the Company unless the consent of the Company shall be endorsed hereon.

#### **Co-Insurance.**

If the Assured carries a policy of any other insurer covering concurrently a claim covered by this Policy, he shall not recover from the Company a larger proportion of any such claim than the sum hereby insured bears to the whole amount of such concurrent insurance.

#### **Subrogation.**

The Company shall be subrogated in case of any payment under this Policy, to the extent of such payment, to all the Assured's rights of recovery therefor against persons, corporations, or estates.

#### **Changes.**

No condition or provision of this Policy shall be waived or altered except by endorsement attached hereto signed by the President, a Vice-President, Secretary, or Assistant Secretary of the Company; nor shall notice to any Agent, nor shall knowledge possessed by any Agent or by any other person be held to effect a waiver or change in any part of this contract. The personal pronoun herein used to refer to the Assured shall apply regardless of number or gender.

#### **Declarations.**

The statements in Items numbered one to seven inclusive, in the Declarations hereinafter contained, are warranted by the Assured to be true except such as are declared to be matters of estimate only. This Policy is issued in consideration of such warranties, the provisions of the Policy respecting its premium and the payment of the premium in such Declarations expressed.

In the Declarations are included items as follows: Item 1. Name, address, occupation, etc., of Assured. Item 2. Period of the Policy. Item 3. Description of car or cars and statements as to the kind of use made of them, for pleasure, commercial, etc. Item 4. Limits of the Company's liability. Item 5. Method of garaging cars. Item 6. No personal injury has ever been caused by any automobile driven by or for me—except as herein stated. Item 7. No similar insurance has been declined or canceled by any company during the past three years—except as herein stated.

The following are extracts from the property damage certificate:

## SECTION IX

## Digest of Automobile Laws of the Various States

## ALABAMA

**Registration.**—With the Probate Judge of resident county, or county in which machine is to be used, not over ten days after securing the machine, fee, 25 cents; non-transferable certificate; manufacturers and dealers only required to register machines kept for private use; number of lamps not specified and no provision made for numbers; equipment required is, brake, muffler and a non-odiferous appliance.

**Speed.**—When passing church or school during session, 8 m. p. h.; 4 m. p. h. when going over causeways and dams not over 20 feet wide; when given signal must stop machine and engine for restless horse.

**Non-Residents.**—Same as residents.

## ARIZONA

Regulations local, no State law.

## ARKANSAS.

No State law, regulations local.

## CALIFORNIA

**Registration.**—With Secretary of State; fee, \$2.00; manufacturers and dealers allowed to register one car of each style and duplicate seals for others costs 50 cents; good for 5 days after sale of car; chauffeurs' license, \$2; when operating must wear badge furnished by Secretary of State; circular metal seal displayed on car and returned to Secretary of State on sale of car; tag displayed on rear; numerals 3 inches high, strokes  $\frac{1}{2}$  inch wide, and abbreviated name of state 1 inch high, characters to be black on white background; two white lights forward showing numbers in figures 1 inch high and red light reverse from one hour after sunset to one hour before sunrise; must be equipped with brakes and sound signal on approaching pedestrian or person in charge of a horse.

**Speed.**—Always reasonable, in built-up sections 10 m. p. h., 15 miles elsewhere in municipalities; outside, 20 m. p. h.; on approaching bridge, dam, sharp curve or steep descent, stop car on signal from driver of horses, and stop engine on request.

**Non-Residents.**—Temporarily in state exempt if tag of state of residence is displayed on rear.

## CONNECTICUT

**Registration.**—Renewed annually by Secretary of State: fee for each certificate; cars under 20 H. P., \$3; over 20 and under 30 H. P., \$5; over 30 H. P., \$10; motorcycles, 50 cents; distinguishing number, for manufacturers, \$1; dealers, \$10; opera-

tor's licenses, for persons 18 years old or over, \$2, must be renewed yearly, carried while operating and may be revoked at any time by the Secretary of State: license to operate motorcycle, 50 cents; number tags to be carried stationary, front and rear, numerals 4 inches high, strokes  $\frac{1}{2}$  inch wide, not over two tags to be displayed on either front or rear; on motorcycles, initial letters of state and numerals at least 1 inch high painted or displayed on tag; at least one light forward, visible 200 feet, and red light on rear so arranged as to throw white light upon rear number tag, from one hour after sunset to one hour before sunrise; must be supplied with serviceable brakes and signal device which must be visible when approaching sharp turn, bridge, curve or steep descent: motorcycle not to be operated with open muffler.

**Speeds.**—Careful and reasonable at all times; 25 m. p. h. for distance of  $\frac{1}{4}$  mile sufficient evidence of violation of speed provision; speed to be reduced upon approaching or passing pedestrian, horse, highway crossing, bridge, sharp curve or steep descent: must stop both car and engine on signal from teamster.

**Non-Residents.**—Exempt for not over ten successive days at any one time; exemption revoked upon being convicted of violating laws.

## DELAWARE

**Registration.**—Annual with Secretary of State, fee \$5; motorcycles, \$3. operators fee, \$5, minimum age of operator, 16 yrs.; transfer of license on sale of machine, \$1; dealers license fee, \$5; tags must be carried on front and rear of autos, and on either side of motorcycles; dealers supply own tags with numbers 5 inches high and words "Delaware Dealer"; rear tag illuminated and at least one white light forward and red light in rear from one hour after sunset to one hour before sunrise; cars must be equipped with brakes and signal device; tire chains prohibited except on highways of natural dirt, plank, asphalt, brick, Belgium block or one inch of ice or hardened snow, unless necessary for safety.

**Speeds.**—Always reasonable, 12 m. p. h. where buildings are less than one hundred feet apart; 6 m. p. h. at curves and intersections, and 20 m. p. h. in open country, reduced to 12 at curves, intersections, steep descents and when passing other vehicles; cars must stop on signal or request from person in charge of horse.

**Non-Residents.**—Reciprocal exemption privileges.

**DISTRICT OF COLUMBIA**

**Registration.**—With Secretary of Automobile Board, fee \$2 for each tag; applicant must qualify before Board of Examiners, no fee; unlicensed person may operate if accompanied by licensed chauffeur; temporary permits issued pending examination; tags must have letters at least 3 inches high and the initials "D. C.," to be carried on rear of machine; two lamps front and one red tail lamp carried on left side of car and throwing white light on license tag; cars must be equipped with signal and locking devices.

**Speeds.**—Within fire limits 12 m. p. h.; in parks, 15 m. p. h.; 8 m. p. h. at street intersections; 6 m. p. h. around corners; 4 m. p. h. on certain specified streets; outside of fire limits 20 m. p. h.; 12 m. p. h. when meeting or passing other vehicles. Must stop machine on signal from driver of horse.

**Non-Residents.**—Own state credentials sufficient for transient tourists, provided resident state tag is displayed; other non-residents are exempted for 60 days upon registering with Secretary of Automobile Board within 24 hours after arrival.

**FLORIDA**

**Registration.**—With Secretary of State giving description of car, fee \$2; no time limit; registration transferable on sale of the machine, fee \$2; operators license fee, \$2; tags to have numerals at least three inches high and two inches wide, to be displayed on the rear of car; two lamps between sunset and sunrise; signal must be sounded on approaching pedestrian or person in charge of horse.

**Speeds.**—At sharp curves, bridges, fills and intersections, 4 m. p. h.; at all other times speed to be reasonable and machines to be under perfect control; must stop machine on signal from person driving horse and stop engine, if so requested; speed limits may be set aside by County Commissioners for speed contests or races.

**Non-Residents.**—Exempt for 30 days.

**GEORGIA**

No state, law, regulations local.

**IDAHO**

No state, law, regulations local.

**ILLINOIS**

**Registration.**—With Secretary of State within ten days of acquisition; registration fee, \$2; dealers must register one car of each class or type; chauffeurs' license, \$1; badges to be worn when operating; circular metal seal furnished by Secretary of State must be affixed to car; registration number must be displayed both front and rear, numerals 4

inches high, strokes  $\frac{1}{2}$  inch wide with abbreviation "ILL" 1 inch high; figures black on white background; two lights visible 200 feet ahead and state abbreviation on glass to be lighted from sunset to one hour before sunrise; cars to be equipped with brakes and signal device, signal must be sounded upon approaching pedestrian or horse.

**Speeds.**—15 m. p. h. through residential districts; in business portions of towns, cities and villages, 10 m. p. h.; 6 m. p. h. at corners; elsewhere 20 m. p. h.; speed must always be reasonable; cars must stop on signal from driver of frightened horse.

**Non-Residents.**—Exempt provided tags of resident state are displayed front and rear.

**INDIANA**

**Registration.**—With Secretary of State; fee \$1; no time limit and non-transferable; manufacturers and dealers must register one machine of each style or type, duplicate seals 50 cents each; tags to have white numbers on black ground at least 4 inches high and  $\frac{1}{2}$  inch wide; also state initials; numbers to be displayed front and rear; must also display circular metal seal furnished by Secretary of State; registration expires on sale of machine but same number may be reassigned to new machine; lamps to be carried after dark; car must be equipped with brake and signal which must be sounded on approaching person with horse; provisions as to numbers do not apply to motorcycles.

**Speeds.**—In closely built-up portions, 8 m. p. h.; 15 m. p. h. in other portions of municipalities; 20 m. p. h. in open country; on approaching and traversing bridge, intersection of highways, sharp curve or steep descent, speeds must be reasonable and vehicle under control; 6 m. p. h. while passing horse or other draught or farm animal; rates of speed not to be diminished by any local ordinances.

**Non-Residents.**—Exempt if tag and initial of state of residence is displayed.

**IOWA**

**Registration.**—With Secretary of State, fee \$5; expires on sale of car but old number may be reassigned; dealers must register annually each car separately, application to be made before July 1st of each year; fee \$10; permit expires June 30th following issue; dealers having place of business in more than one city or town must secure permit for each establishment; motorcycle fee \$2; seal furnished by Secretary of State must be displayed on car and no other number; owner must furnish tag to be displayed on rear having numbers 3 inches high and letters "IA" 2 inches high,  $\frac{1}{2}$  inch strokes; at least one



lamp forward and red light on rear between one hour after sunset and one hour before sunrise; cars to be equipped with brakes and signal device.

**Speeds.**—Must always be reasonable; 10 m. p. h. in built-up portions; 15 m. p. h. in all other portions of municipalities and 20 m. p. h. in open country; speed must be reduced when approaching intersections of highways, bridges, sharp curves or steep descents.

## KANSAS

**Registration.**—Not required by state; necessary in some localities; state law provides for one or more lamps between one hour after sunset and one hour before sunrise.

**Speeds.**—In thickly settled districts, 10 m. p. h.; elsewhere 20 m. p. h.; speed must always be reasonable and be reduced at crossings.

## KENTUCKY

**Registration.**—Not provided for by state law, white light must be carried in front and red light in rear, after sunset and before sunrise.

**Speeds.**—10 m. p. h. in thickly settled districts, reduced to 6 m. p. h. at crossings, bridges or descents; 15 m. p. h. in open country; must always be reasonable.

## LOUISIANA

Regulations local, no state law.

## MAINE

**Registration.**—With Secretary of State, fee \$2; no time limit; registration expires on sale of the machine; operator's registration fee \$2; manufacturer's or dealer's license fee \$10; good for 5 days after sale of machine; driver need not be licensed if accompanied by licensed operator; two tags, furnished by Secretary of State, having numbers 4 inches high and the word "Maine" 1 inch high, must be carried on the front and rear; number on the rear of motorcycles is all required; one lighted lamp must be carried between one hour after sunset and one hour before sunrise; cars must be equipped with a signal device which can be heard 300 feet.

**Speeds.**—Always reasonable; 8 m. p. h. in cities, towns, etc., unless local ordinance permits a higher speed; 15 m. p. h. in open country; must stop on signal from driver of horse; special restrictions are made applying to certain specified towns, use of automobiles prohibited in towns of Eden, Mount Desert, Tremont and Southwest Harbor, if act accepted by said towns.

**Non-Residents.**—Exempt if local authorities permit; must carry home state tags front and rear.

## MARYLAND

**Registration.**—With Secretary of State

by affidavit describing machine and stating that owner is competent to drive a car, fee \$3; no time limit; does not apply to manufacturers, except as to machines kept for private use or for hire; persons operating machine as mechanic, employee or for hire, must be licensed, except in the case of a manufacturer's employee testing uncompleted automobiles; numbers issued by Secretary of State, 3 inches high,  $\frac{3}{8}$  inch stroke, white letters on a black background must be displayed on front and rear; number may be used, for 5 days after sale, with written consent of former owner; two lamps throwing light at least 200 ft. with number at least 2 inches high on face and one red light showing from rear must be carried between one hour after sunset and one hour before sunrise; car must be equipped with efficient brakes and signal device which must be sounded every 200 ft. at night if lights fail to operate; must sound signal on approaching pedestrian or horse, also on approaching sharp curves, highway intersections and tops of hills in open country; signal must not be sounded while passing horse.

**Speeds.**—Always reasonable; 6 m. p. h. at intersections of main highways in open country, in built-up portion of municipalities, at sharp curves and where lights fail to operate at night, except in cities of 16,000 or more inhabitants, elsewhere 12 m. p. h.; 6 m. p. h. on approaching horse or other animal, car must be stopped if animal appears to be frightened; speed regulations may temporarily be set aside by the local authorities for the purpose of holding speed contests or races on highways.

**Non-Residents.**—Same as residents.

## MASSACHUSETTS

**Registration.**—With State Highway Commission; annual fee; autos \$5; motorcycles \$2, expires on sale of machine; operator's license \$2; no time limit; professional chauffeur's license, \$2; renewal 50 cents annually; manufacturers and dealers registration fee \$15 for each establishment; certificate must be carried in car; operator's license must always be carried; person operating car need not have license if accompanied by licensed operator; number plates furnished by Commission, except for motorcycles, whereon number must be painted; numerals white on dark blue, 4 inches high, on front and rear; two white lights forward, throwing light 200 ft. from one hour after sunset to one hour before sunrise; number to be displayed on sides and fronts of lamps in numerals 1 inch high; car must have brake, signal device, muffler and locking device.

**Speeds.**—20 m. p. h. in open country; 15 m. p. h. in suburbs and 8 m. p. h. going

around curves or approaching and traversing intersections or in thickly-settled districts.

**Non-Residents.**—Exempt from registration requirements for 7 days providing tag of home state is carried.

#### MICHIGAN

**Registration.**—With Secretary of State, annually; fee \$1; renewals 50 cents; registration expires on sale of car; manufacturer's or dealer's license fee, including five registration seals, \$5; annual renewal \$2.50; operator's license \$1; annual renewals 50 cents; chauffeurs, while operating, must wear badge furnished by Secretary of State; owner of car must provide and carry on front and rear, tags showing number in figures 3 inches high with strokes  $\frac{1}{2}$  inch wide and state initials 1 inch high in white and black; only one registration number to be shown on rear, two white lights on front and one red light on rear must be carried from one hour after sunset to one hour before sunrise.

**Speeds.**—Always reasonable; in municipalities, 15 m. p. h. and 4 m. p. h. in business sections; in open country, 25 m. p. h.; 10 m. p. h. when approaching pedestrian or horse; on signal from driver of any draught animal, machine and engine must be brought to a stop.

**Non-Residents.**—Reciprocal exemption provided tag of home state is displayed on both front and rear.

#### MINNESOTA.

**Registration.**—With Secretary of State, renewed annually, fee \$1.50; dealer's or manufacturer's registration \$10, duplicate renewals \$1; when operating, chauffeur must wear the badge furnished by Secretary of State; tag furnished by Secretary of State must be carried on rear; two white lights forward, and red light in rear throwing white light on rear number tag must be carried from one hour after sunset to one hour before sunrise; cars must be equipped with brakes and signal device, and gasoline cars must use muffler within city or township limits.

**Speeds.**—Must always be reasonable; when approaching or traversing bridge, dam, sharp curve or steep descent, speed must not be over 1 mile in 8 minutes; 25 m. p. h. in open country; on request of driver of horse, operator must stop car, and when necessary, stop the engine; joy riding is made illegal.

**Non-Residents.**—Temporary exemption if home state tag is carried.

#### MISSOURI

**Registration.**—With Secretary of State, fee \$5; seal issued by Secretary of State must be attached to car; registration expires on sale of car by private owner; operator's license fee \$2, issued to persons

over 18 years of age; expires on removal from county of residence; badge must be worn while operating; manufacturers and dealers may register one car of each type; numbers and state initial must be displayed on rear of car and at night also displayed by illuminated device on front of car; numbers not less than 3 inches high, strokes  $\frac{3}{8}$  inch wide and letters not less than  $1\frac{1}{2}$  inches high; two lamps throwing white lights at least 200 ft. shall be carried on the front and at least one red light on the rear, from sunset to sunrise; cars must be equipped with brakes and signal device.

**Speeds.**—Always reasonable; in business portions of cities or towns, 8 m. p. h.; 10 m. p. h. in other portions thereof; where view is obstructed and at highway intersections 6 m. p. h.; car must be stopped on signal from driver of horse or other draught animal.

**Non-Residents.**—20 day exemption providing home state tag is displayed.

#### MONTANA.

**Registration.**—No state provision; local authorities should be consulted.

**Speeds.**—8 m. p. h. in municipal fire districts, elsewhere, 20 m. p. h.; speed to be reduced at intersections of highways, car must be stopped on approaching or passing frightened horse.

**Non-Residents.**—No state provision.

#### NEBRASKA

**Registration.**—Annual with Secretary of State; fee \$1; expires on sale of car; application for new registration must be accompanied by certified bill of sale; metal seal must be carried on car; numerals 3 inches high, on rear of car, with letters "Neb." not less than 2 inches high; one lamp forward and one red lamp reverse between one hour after sunset and one hour before sunrise.

**Speeds.**—Always reasonable; 10 m. p. h. in built-up portions; in other portions of cities, towns, etc., 15 m. p. h.; in open country 20 m. p. h.; operator must stop car on signal from driver of any draught animal.

**Non-Residents.**—Exempt providing tag of home state is displayed.

#### NEVADA

No state law affecting use of pleasure cars.

#### NEW HAMPSHIRE

**Registration.**—With Secretary of State; fee, \$10 annually; certificate must always be carried in car; expires on sale of machine; collective registration of cars by manufacturers or dealers allowed; fee, \$25; motorcycle registration fee, \$2; fee for number tags, \$1 per pair; private operator's annual license, \$1; professional chauffeur's license, \$5 annually; unlicensed per-

son may drive if accompanied by licensed operator; tags must have numerals 4 inches high, followed by the letters "N. H."; carried both front and rear; motorcycles need carry only one tag; two lamps, having number 1 inch high on face, must be carried between one hour after sunset and 1 hour before sunrise, car must be equipped with brake, muffler and signal device; muffler must be used in built-up portions of towns; signal must be sounded at intersections and curves.

**Speeds.**—10 m. p. h. in business districts of towns; elsewhere 25 m. p. h.; must be reduced at crossings, curves, descents and bridges; must stop car on signal from person in charge of horse.

**Non-Residents.**—Exempt for 10 days if law of home state is complied with and tag displayed.

### NEW JERSEY

**Registration.**—With Commissioner of Motor Vehicles; annual; fee, 1 to 10 H. P., \$3; 11 to 29 H. P., \$5; 30 H. P. or over, \$10; fee for transfer, \$1; motorcycles, \$2, annually; manufacturer's and dealer's fee, \$5 per car; operator's license, issued after examination, less than 30 H. P., \$2 annually; 30 H. P. or over, \$4; certificate must be carried when operating; numbers, on both front and rear must be 4 inches high and have strokes  $\frac{1}{2}$  inch wide; numbers on motorcycles such as Commissioner may prescribe; 2 white lights forward, visible 250 feet, and one red light reverse must be carried from 30 minutes after sunset to 30 minutes before sunrise; motorcycles, 1 white light, visible 200 feet forward between 1 hour after sunset and 1 hour before sunrise; autos must have efficient brake and if over 10 H. P., two brakes, one of them foot operated; motorcycle must have one brake, hand or foot operated.

**Speeds.**—8-47 m. p. h. on curves; 15 m. p. h. at intersections; 12 m. p. h. in built-up portions of towns and cities; 15 m. p. h. within 200 feet of horses, etc.; 25 m. p. h. in open country.

**Non-Residents.**—License good for 8 days or four periods of two days each, issued upon payment of \$1.

### NEW MEXICO

Regulations local, no State law.

### NEW YORK

**Registration.**—With Secretary of State, seal must be displayed on car; fee, \$2; seal to be returned within 10 days after sale of car, except in the case of the vendor being a manufacturer or dealer; manufacturers and dealers required to register one car of each type, duplicate seals, 50 cents; chauffeur's fee, \$2; tag to have black numerals on white ground, 3 inches

high, stroke  $\frac{1}{2}$  inch wide, state initials 1 inch high, on rear of car; 2 lamps forward, having number on face 1 inch high and one red lamp reverse; cars must be equipped with brakes and signal device; joy-riding prohibited.

**Speeds.**—Always reasonable; 10 m. p. h. on business and built-up districts; 20 m. p. h. in open country.

**Non-Residents.**—Exempt if laws of home state are complied with and tag displayed on rear.

### NORTH CAROLINA

**Registration.**—With Secretary of State, annually on first of July; fee, \$5; renewals, \$1; certificate must be returned within 10 days, on sale of car; fee for transfer of number, \$1; seal must be displayed on car; tags must be carried on front and rear, have black numeral 3 inches high, strokes  $\frac{1}{2}$  inch wide, state initials 1 inch high, on white ground; two white lights forward and one red light reverse, between one hour after sunset and one hour before sunrise; reasonable warning must be given to driver of horse.

**Speeds.**—Always reasonable; 8 m. p. h. in business portions and 12 m. p. h. in other sections of towns and cities; 25 m. p. h. in open country; 5 m. p. h. when approaching or traversing intersections, curves, steep descents, bridges and dams; 8 m. p. h. when near draft animal; must stop car and engine on request of driver of frightened horse and male occupants 15 years old must render necessary aid; local authorities may reduce speed limits but must post signs stating rate permissible.

**Non-Resident.**—Temporarily exempt.

### NORTH DAKOTA

**Registration.**—Not required by state; no state law requiring numbers; cars must carry two lights in front; motorcycles to carry one light; must sound signal when overtaking draught animals; must use muffler when on streets of villages, towns or cities and when passing horse-drawn vehicle

**Speeds.**—8 m. p. h. in built-up portions; 25 m. p. h. in open country, must stop on signal from driver of draught animal.

### OHIO

**Registration.**—Annual, before January 1st; with Secretary of State; fee, for gasoline or steam cars, \$5; for electric cars, \$3; manufacturers' or dealers' fee, \$10 annually for each make, determined by motive power; \$2 for each duplicate, including tags; chauffeurs' fee, \$2 annually; badge must be worn while operating; tags must be carried front and rear; cars must be equipped with brakes and signal device; must carry 2 white lights forward and red light reverse, throwing

white light on rear number, from 30 min. after sunset to 30 min. before sunrise.

**Speeds.**—Always reasonable, 8 m. p. h. in built-up portions of municipalities; 15 m. p. h. in other portions thereof; 20 m. p. h. in open country; rates not to be diminished by local authorities; must reduce speed when approaching horse or other draught animal and must stop on signal; owner's written consent must be in possession of person operating car in his absence.

**Non-Residents.**—Exempt if law of home state is complied with.

#### OKLAHOMA

Regulations local, no State law.

#### OREGON

**Registration.**—With Secretary of State; fee, \$3; no time limit; number and State initials, 3 in. high, shown on rear in light color; one light showing white forward and red reverse; number on white glass; cars must have brakes and use mufflers in city limits.

**Speeds.**—8 m. p. h. in built-up portions of villages or cities, 8 m. p. h. when within 100 yds. of a horse, in open country, 24 m. p. h.; 4 m. p. h. at crossings; cars must reduce speed on observing frightened horse and stop on request.

**Non-Residents.**—Exempt if laws of home state are complied with and tag is displayed.

#### PENNSYLVANIA

**Registration.**—With State Highway Department; annually; fee, less than 20 H. P., \$5; 20 H. P. or over, \$10; motorcycles, \$2; professional operator's license, \$2; must carry license and wear badge outside when operating; to operate when under 18 years old a special license is necessary; registration expires on sale of machine; may be reassigned to vendor, on payment of \$1 fee; dealer's registration, \$5; tags to be carried on front and rear; motorcycles must have 3-inch numbers attached to or painted on rear mud-guard; rear number on cars to be illuminated by white light from red tail lamp and two white lights visible 200 feet, must be carried forward between 1 hour after sunset and 1 hour before sunrise; one light forward on motorcycle; use of cut-outs prohibited when passing vehicle.

**Speeds.**—Reasonable and not over 24 m. p. h.; must not overtake car on side where passengers are being discharged.

**Non-Residents.**—Reciprocal 10 day exemption provided tag of home state is displayed.

#### RHODE ISLAND

**Registration.**—With Board of Public Roads, expires within a year or on sale of car; fee, 20 H. P. or less, \$5; 21 to 30 H. P., \$10; 31 to 40 H. P., \$15; over 40 H. P., \$25; motorcycle, 50 cents, dealers' fee,

\$50; operators' license, good for year, \$1; motorcycle, 50 cents; certificate of registration must be carried in car, and license when operating; person driving need not be licensed if accompanied by licensed operator; tags having numbers and state initials 4 inches high, front and rear; motorcycle number either painted on, or on tag 1 inch high, one white light forward, and one red light reverse, throwing white light on rear numbers, from 1 hour after sunset to 1 hour before sunrise; cars must have brake, muffler, signal and also a locking device which must be used when car is left unattended; motorcycle not to be operated with cut-out open; tire chains may be used on macadamized roads only when necessary for safety.

**Speeds.**—Always reasonable; 15 m. p. h. in built-up portions, 25 m. p. h. in open country; racing prohibited; must stop on signal from driver of horse.

**Non-Residents.**—20 day exemption per year providing home state laws are complied with and tag displayed; conviction for violating regulations revokes license.

#### SOUTH CAROLINA

**Registration.**—With Clerk of County Court; within 10 days after acquisition of machine; fee, \$1; dealers and manufacturers exempt except as to machines kept for private use or hire; number and county name on rear of car; black characters, 3 inches high, strokes  $\frac{1}{2}$  inch wide, on white ground; carried on rear; at night and in fog must carry white light forward and red light reverse.

**Speeds.**—Always reasonable, 15 m. p. h. limit and 6 m. p. h. at highway intersections, bridges, curves and steep descents.

**Non-Residents.**—No state provision.

#### SOUTH DAKOTA

**Registration.**—With Secretary of State; fee, \$1; no time limit, expires on sale of machine but old number may be reassigned to vendor; seal furnished must be displayed on car, number on rear 3 inches high also letters "S. D." 2 inches high; one light forward and red light reverse, showing number 1 inch high, between 1 hour after sunset and 1 hour before sunrise.

**Speeds.**—Always reasonable; 10 m. p. h. in built-up portions of cities and towns; 15 m. p. h. in other portions thereof; 20 m. p. h. in open country; must stop for frightened draught animal.

**Non-Residents.**—Exempt if own state tag is carried on rear.

#### TENNESSEE

**Registration.**—With Secretary of State; fee, \$2; certificate to be filed with County Clerk; fee, \$1; transfer fees, \$1 to state and 50 cents to county; owner provides

number tags; numerals 3 inches high x  $\frac{1}{2}$  inch wide; plates, 4 inches x 7 inches; carried front and rear; no other tags to be carried.

**Speeds.**—20 m. p. h. which can be lowered by local authorities; must sound signal on overtaking draught animal and stop if same becomes frightened.

**Non-Residents.**—Required to register.

### TEXAS

**Registration.**—With County Clerk; fee, 50 cents; owner must provide tag having figures 6 inches high; one lamp forward from 1 hour after sunset to 1 hour before sunrise; signal carried must be one that can be heard 300 feet.

**Speeds.**—Always reasonable; 8 m. p. h. in built-up portions unless local authorities permit higher rate; 18 m. p. h. elsewhere; must stop on signal from person in charge of draught animal.

**Non-Residents.**—Not referred to.

### UTAH

**Registration.**—With Secretary of State; fee, \$2; manufacturers, dealers and taxicab operators may register 1 machine of each style or type; duplicate seals, 50 cents; expires on sale, new owner may operate 10 days on old number; vendor may have number reassigned, fee, \$2; owner must notify of intention to sell; seal furnished must be displayed on car; number tag with numbers 4 inches high, strokes  $\frac{1}{2}$  inch wide and letter "U" 1 inch high must be carried stationary on rear; brakes and signal device required; must carry 2 white lights forward, 1 red light reverse, from 1 hour after sunset to 1 hour before sunrise.

**Speeds.**—Always reasonable; 10 m. p. h. in built-up portions; 15 m. p. h. elsewhere in cities and towns; 20 m. p. h. in open country; 6 m. p. h. near highway intersections, bridge, dam, curve, dugway or steep descent; rates cannot be lowered by local authorities; must stop on signal from driver of horse; must give name and address in case of accident.

**Non-Residents.**—Temporary visitors exempt if home state tag is displayed on rear.

### VERMONT

**Registration.**—Annual with Secretary of State; fee, first year, \$1 per H. P.; second year, 75 cents per H. P.; thereafter, 50 cents per H. P.; after August 1st, half rates; transfer to new owner, \$1; dealers' or manufacturers' annual fees, \$25; operators' license fee, \$2 annually.

**Speeds.**—10 m. p. h. in built-up portions or 25 m. p. h. in open country is unreasonable; local regulations; joy-riding prohibited.

**Non-Residents.**—Reciprocal exemption for 10 days if home state law is complied with; 10 to 60 day registration fees, \$3

up to 20 H. P.; 21 to 39 H. P., \$6; and \$10 for cars of over 40 H. P.; when making over 60 day stay in state must register same as residents.

### VIRGINIA

**Registration.**—With Secretary of Commonwealth; duplicate certificate must be attached to machine, fee, \$2; non-transferable and expires on sale of car; plate furnished having figures 4 inches high and letters "Va" to be attached to rear; brake, signal and locking device required, latter to be used when car is left unattended; must carry 1 light visible 100 feet forward and red lamp reverse throwing white light on number tag.

**Speeds.**—12 m. p. h. in township or city limits; 8 m. p. h. in built-up portions of same; in open country 15 m. p. h.; must slow up for horse and stop on signal from driver.

**Non-Residents.**—Same as residents.

### WASHINGTON

**Registration.**—Annually before June 1st; fee, \$2; number preceded by "Wn" must be carried on rear; light numerals 4 inches high on dark ground; must carry brakes and bell or horn; one light after dark white forward with 1 inch numerals on glass and red reverse; use of cut-out not allowed in city limits.

**Speeds.**—Always reasonable; 12 m. p. h. in built-up portions; 4 m. p. h. over crossings in same; 24 m. p. h. in open country; must slow up for horse and stop on signal from driver; turn to right when overtaking vehicles or pedestrians.

**Non-Residents.**—Exempt if tag of home state is displayed on rear.

### WEST VIRGINIA

**Registration.**—With State Auditor; fee, \$10; duplicate tags, \$1; tags to be carried front and rear.

**Speeds.**—No state provision.

**Non-Residents.**—No state provision.

### WISCONSIN

**Registration.**—With Secretary of State; 2 certificates issued, one must be carried in car; fee, \$3; transfer fee, \$1; manufacturers' fee, \$5; fee for motorcycles, \$1; number tag furnished to be carried on rear; numerals 3 inches high, also letter "W" to be on tag; one lamp forward, brakes and signal device required.

**Speeds.**—12 m. p. h. in towns, 25 m. p. h. in open country; reduced at crossings, curves and descents; car must be stopped on signal from driver of horse; power must be shut off when car is left unattended on highway.

**Non-Residents.**—Exempt if tag of home state is displayed.

### WYOMING

No state law, regulations local.

# Dealers and Garage Proprietors

Pictures of your place of business (exterior or interior) in natural colors on post cards are just what you ought to have for local advertising. Write to us for samples and prices.

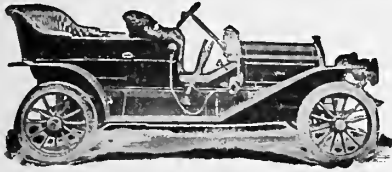
If you have any illustrations or photographs send them to us and we will tell you how they can be used for post cards. No charge for the information. This is the modern (personal appeal) way to advertise.

**CHILTON COMPANY**  
MARKET AND 49th STS., PHILADELPHIA

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## A REAL LINE of REAL MERIT!

### CRAWFORD CARS for 1910



Model 10, 24-28 H. P.  
5-Passenger Touring Car, \$1350

Superior quality of all material used, expert workmanship, beauty of design and finish, ready accessibility of all parts and other vital features all combine to make the CRAWFORD CARS unexcelled for reliability, simplicity, for ease in operation and full value.

Full particulars upon application.

Crawford Automobile Company  
Hagerstown, Md.



## Our New No. 7

1910 Model Adjustable Sectional Vulcanizer with three cavities. Capacity from 2" motorcycle to 4 1/2" automobile tires. It has 12 pair of bead irons, thus insuring a perfect fit for all the various makes of tires, either Clincher, Dunlop or Goodyear style of Fisk mechanically fastened, also the double Clincher type of motorcycle tire. This vulcanizer is furnished with gas or gasoline burner or to connect direct with steam boiler. Our new 1910 vulcanizer is cast in one piece and is steam jacketed like all our other vulcanizers. You cannot afford to be without our three cavity adjustable sectional vulcanizer. It is a money saver and a money maker. Write for catalogues and discounts.

AUTO TIRE VULCANIZING CO.  
Lowell, Mass., U. S. A.

We Make  
Magnetos



For Two-Cylinder REOS, MAXWELLS, BUICKS, MOLINES, JACKSONS, AUBURNS, etc. Also for any number of CYLINDER MARINE MOTORS AND STATIONARY GASOLINE ENGINES

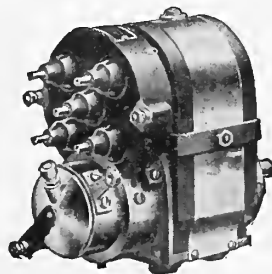
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RELIABLE ELECTRIC MFG. CO.  
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MEANS QUALITY



In building the automobile of to-day, quality must be considered; as a cheap part injures the reputation of the completed car. If you are looking for a strictly high-grade magneto, try a KURTZ. Our aim is Quality and Efficiency.

Hercules Electric Company  
INDIANAPOLIS, INDIANA

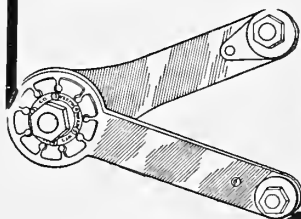


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The Only Two  
Friction Plane

## SHOCK ABSORBER

Pay for your shock absorber in accordance with the weight of your car. Westen two friction plane shock absorbers are made in three sizes and are easily adjusted to any model or make car. They reduce the cost of up-keep 50% and eliminate all spring trouble. The two friction plane feature is new in shock absorber construction—Write for full information.



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MFG. CO.**

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## Barnes Gear Co.

Steering Gears

Transmissions

Differentials

Oswego, N. Y.

## We Only Make AXLES

Front and Rear  
I-Beam or Tubular  
Bevel or Chain Driven

## HUBS

Ball Bearing

## RIMS

Clincher  
Quick Detachable  
Demountable

Rear Axle Factory	-	-	180,000 sq. ft.
Front Axle Factory	-	-	90,000 " "
Hub and Rim Factory	-	-	90,000 " "
Total	-	-	360,000 " "
1910 Output	-	-	80,000 Sets
1911 Capacity	-	-	150,000 " "

We make more than any other manufacturer in the world.

**WESTON-MOTT CO.**

Established 1884 FLINT, MICH.

\$1.00

\$1.25



THE PLUGS OF OUR  
MANUFACTURE ARE  
THE GREATEST VALUE  
IN SPARK PLUGS EVER  
PRODUCED—ONLY  
THE BEST OF MA-  
TERIAL USED.

Reliance Regular—known and purchased everywhere—the spark in water feature made it famous. Slight changes have been made, but the original principle still remains untouched. Our output is enormous—it enables us to sell the best manufactured plug at the price of the ordinary—\$1.00. Ask your dealer or send direct.

Reliance Magneto—Made for those who desire a magneto plug constructed on Reliance principles. Workmanship and material used consistent with that used in all the plugs of our manufacture. This plug is recommended where an excessive amount of oil is used. Ask your dealer, he sells it for \$1.25; or send direct.

### JEFFERY-DEWITT CO.

Spark Plug Manufacturers

216 High St., Newark, N. J.

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The fact that you have never experienced a broken spring does not imply that you will always escape. The unexpected always happens, and possibly at the most inopportune time you will have a sad awakening to the fact that you have realized a broken spring. Be on the safe side and have on hand at all times an **AUTO SPRING REPAIRER**, and enable yourself to ride with an easy mind.



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Repairer supporting leaf, broken half way between centre of spring and horn (or end) of spring, and preventing other leaves from breaking.



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Repairer attached to spring, broken in center at spring bolt.

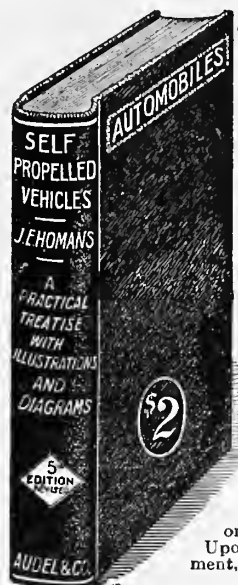


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Repairer taking place of horn (or end of spring) which has snapped off. By inserting bolt in hole shown and fastening same to top spring as before the break, the spring end is replaced as though the break had never occurred.

Price, \$4.00, complete  
**AUTO SPRING REPAIRER CO.** 123 Liberty St., N. Y.

## HOW TO RUN AN AUTO



"Homan's Self Propelled Vehicles" gives full details on successful care, handling and how to locate trouble.

Beginning at the first principles necessary to be known, and then forward to the principles used in every part of a Motor Car.

It is a thorough course in the Science of Automobiles, highly approved by manufacturers, owners, operators and repairmen. Contains over 400 illustrations and diagrams, making every detail clear, written in plain language. Handsomely bound.

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### Simplifies the Automobile

Friction-drive does away with the clutch, gears, universal joints, saves power, lessens weight and cost, and gives unlimited speed changes, instantly made without noise or fear of breakage.

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**Prompt Delivery  
Best Quality  
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**ANYBODY CAN USE ONE**


**Electric, Gas or Gasoline Heated.**

Mend your own casings and inner tubes with our Vulcanizers.

Booklet on tires and tire repairing for the asking. Let us tell you how to do it. Sold on Guarantee.

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Our Stitch Nine has four faces,  $3\frac{1}{2}'' \times 5''$ , and will work right up against the rim. Price, with any combustible heat, \$11.00.

Our Stitch-in-Time has two faces,  $2\frac{1}{2}'' \times 3''$ , and will work anywhere on any size tire right up against the rim. Price, with combustible heat, \$6.50.

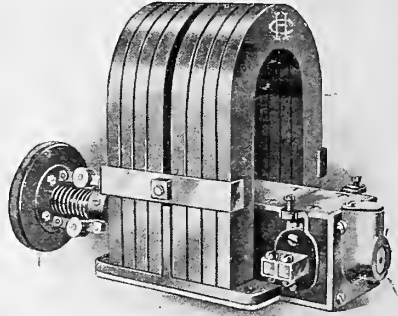
Our Pig Vulcanizer is 8'' long, the full oval of the tire, and can't be beat for large repairs and small blowouts in casings. Our Vulcanizers are much better and cheaper than any of the imitations on the market. Ask for Circular CA at once. All Vulcanizers are made of Aluminum.

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For High Efficiency and Durability

**"WS"** For Wipe or Touch Spark **"JS"** For Jump Spark Work

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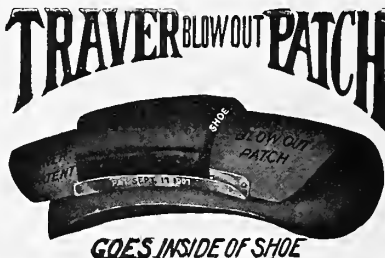


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**BOSTON (BROOKLINE), MASS.**

**Western Branch**

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**GOES INSIDE OF SHOE**

Made of **FABRIC** and Rubber like an **AUTO SHOE**; with a brass flange that prevents it from **"CREEPING."**

**YOU NEED NOT CARRY EXTRA SHOES** if you carry Traver Patches.

**THE ONLY** road repair for a **RIM CUT**; **THE BEST** in the World for a **BLOWOUT**

**DON'T THROW WORN SHOES AWAY** Traver Patches Make Them Serviceable

**A MONEY-SAVER** for the **OWNER**  
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**FOUR SIZES**

No. 0—For shoes  $2\frac{1}{2}$  and 3 in. ....\$2.50  
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**Three Styles: CLINCHER—DUNLOP—FISK**  
State Size and Style required

For Sale by All Dealers, or Sent Anywhere in the United States upon receipt of price.

**Traver Blowout Patch Co.**

**Patentees and Manufacturers**

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**MORGAN & WRIGHT TIRES**  
**ARE GOOD TIRES**

You will notice that the motorists who have any doubts about this statement are the ones who have never given

**Morgan & Wright Tires**  
**a thoro trial.**

**MORGAN & WRIGHT**  
**DETROIT**



Round-tire Trunk

Arranged for Hats, or Plain for Inner Tubes

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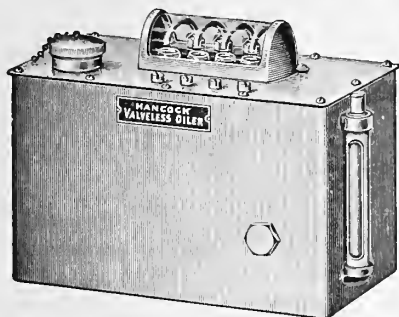
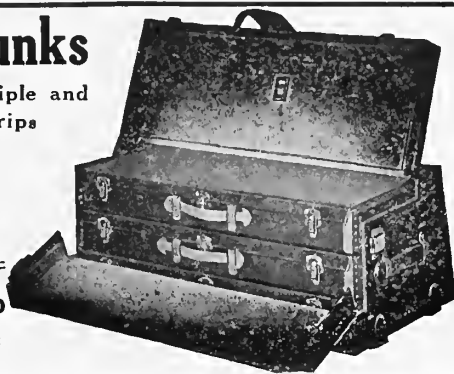
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## IF YOU WANT A CAR

to be reliable, you must have a reliable oiler. You can never find a more reliable, simple, positive or economical oiler than the

### HANCOCK VALVELESS

That's a fact and we'll prove it any time you say.  
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Are designed and manufactured as a strictly high-grade equipment for high-grade cars. Both straight and Zig Zag Shields are automatic; operate smoothly and easily with one hand, and lock positively in both upright and folded positions. Guaranteed not to rattle or wear loose at any point. Our Automatic Tilting shield for Roadsters and large Touring Cars is the handsomest job that has ever been manufactured.

Write for discount to the trade, or order sample shield for your demonstrating car.

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872 Woodward Avenue Detroit, Michigan

## MANUFACTURERS, WHY NOT?

When contracting for STEERING GEARS take advantage of years of experience in the building of this part of your car.

**We Have** 50,000 square feet and thousands of dollars' worth of special machinery for the manufacture of steering gears.

**We Make** every part, from the wheel to the ball arm.

**Therefore we guarantee** deliveries our customers can depend upon.

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MANUFACTURING  
COMPANY**

Write for Catalogue at Once

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BRANDENBURG & CO., Sales Agents  
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YOU have, without doubt, a number of customers who want the "BEST" of everything and are willing to pay a fair price if they get "WHAT THEY ASK FOR." Every reliable line you add to your stock helps you hold their trade, gains their confidence and makes them feel that you know what good things are.

*There is a universal demand for ALBANY GREASE and that's why reputable dealers carry it in stock. DO YOU?*

Only Made by **ADAM COOK'S SONS, NEW YORK**

## OVERHEAD VEHICLE WASHER

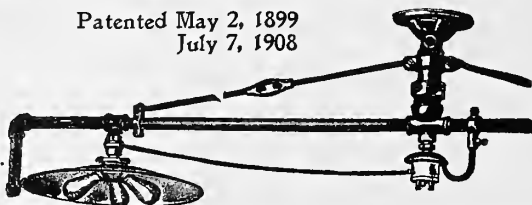
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Saves Water

Patented May 2, 1899  
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Saves Hose

Saves Time



Fully Guaranteed

The strongest simplest and best washer made. Head of cast bronze. **ILLUMINATED OR PLAIN**

Water shuts off back of all working joints, insuring against leaks and freezing. Agents wanted. Send for prices.

VEHICLES SPECIALTY CO.

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STANWOOD  
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Our 1910 High Tension Models for 1, 2, 4 and 6-cylinder motors are now ready.

We are building each Magneto as an individual job—not the most in quantity, but quality unexcelled. Our price, too, is moderate and will surprise you.

We invite correspondence from the manufacturer of automobiles and motor driven vehicles.

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A clean, pure Linseed Oil Soap for washing all parts of automobiles, carriages, woodwork and marble. Will not injure the finest varnish finish but will retain its lustre and thoroughly clean. Delightful to use, as it gives a soft, mild and abundant lather.

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*"Best for Your Engine"*

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**COLUMBIA LUBRICANTS CO. of N. Y.**  
116 Broad Street :: :: New York City

# Better Lubrication for YOUR Motor

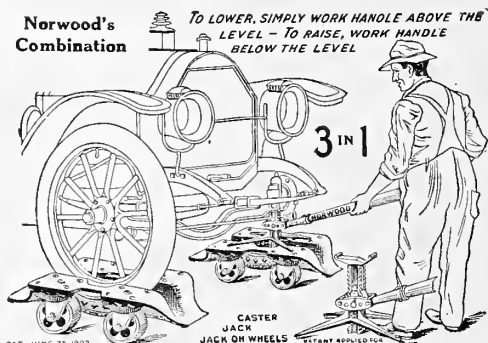
Includes the use of Dixon's Graphite Motor Lubricants

**D**IXON'S FLAKE GRAPHITE, you know, renders lubrication in the face of extreme heat or cold; ignores acids and alkalies; stays right with the bearing parts, reduces friction, saves wear on the metal. Do you know of any substitute that will produce this service?

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Combination**



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Don't lift or drag your cars around; use a **Norwood Caster**.

You can handle your cars either with or without their wheels.

*The Best, Simplest, Lightest, Smallest and Most Satisfactory Device for Handling Automobiles That Has Ever Been Introduced.*

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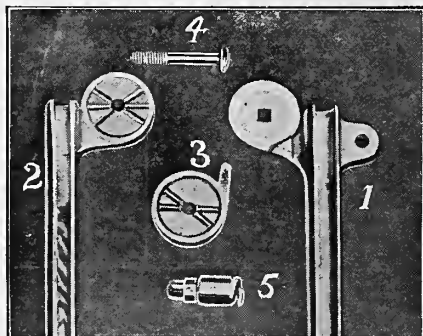
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P.S. We also make a permanent turntable, unequalled in price and efficiency.

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The cut shows the vital working parts of the lightest, strongest, simplest automatic wind shield ever produced.

Back of upper section (2) rests against front of lower section (1). No. 3 with its hardened steel roller bearings packed in graphite engages No. 2. Parts are held together by bolt (4) and cap nut (5) containing steel spiral tension spring.

Automatically adjustable to three positions. Write for Catalog "a."

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Norwalk, Ohio

## "The Empire" Jack



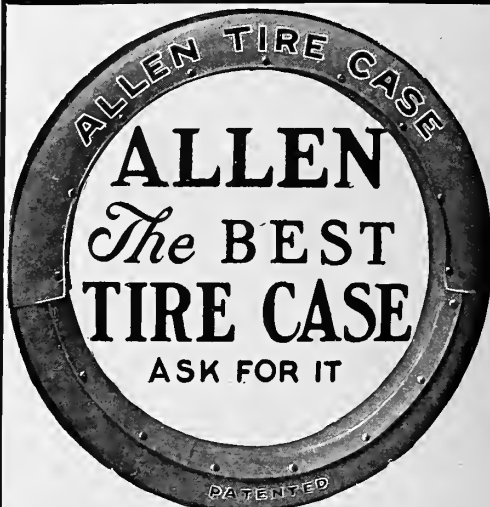
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Have you bought that tire case for your extra tires? Equipping season is here. Buy an Allen Tire case to-day. You'll need it. Every dealer sells them.

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the kind which allow free action to the spring over smooth roads and pavements and act only when you strike a bump. Foster Shock Absorbers make rough roads seem smooth where others make smooth roads seem rough.

Built on right principle, free in center and bind gradually going up and coming down.

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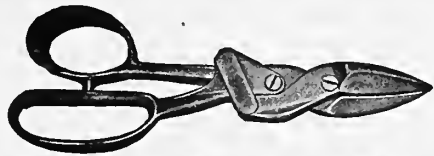
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Look at the cut; study it carefully, and you'll comprehend some of its advantages. It looks good you'll say, but wait till you try it, you'll be surprised. Experts pronounce it the best hand snip ever produced.

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*(Illustrations of people in robes for Summer, Winter, and Spring)*

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No. 2 SHIELD  
Showing Complete Double Fold Over the Hood

**5 STYLES** SPECIAL STRAIGHT DOUBLE FOLD HALF FOLD ZIG ZAG

**ONE QUALITY THE BEST**

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**The Best Ignition Equipment Co.**

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**SEXTETTE AND TRIPLE AUTOMATIC WIND SHIELDS**

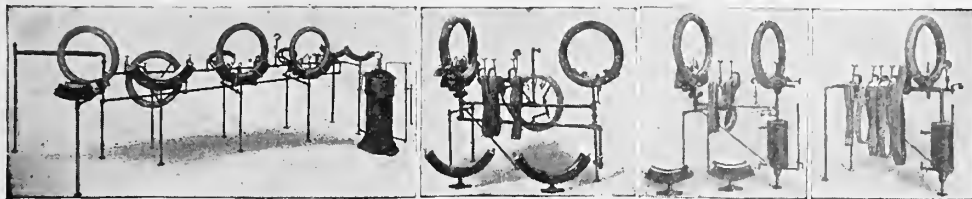
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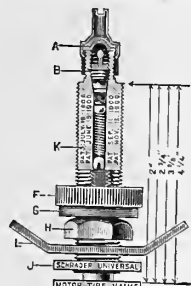
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ESTABLISHED 1844

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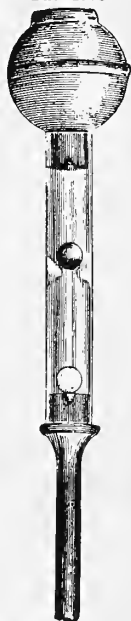
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Pat. 1906



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It is self contained.

No hydrometer.  
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No syringe is  
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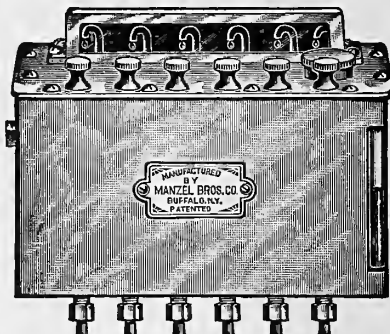
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Lasts the longest  
Requires the least lubrication

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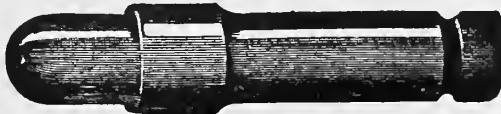
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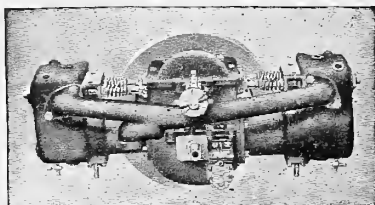
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A change of motor, like a change of air,  
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It hasn't an equal on the market for  
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**Pfanstiehl Magnetos**,—reliable, neat and  
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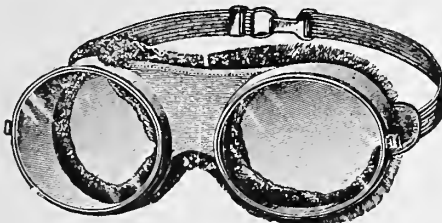
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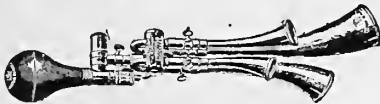
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Color . . . . . Royal Blue	Radiator . . . Vertical tube
Seats . . . . . Four or five	enamel
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Wheel-base . . 110 inches	shell
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Horse Power, Thirty	ing gear on
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Bore . . . . . 4 inches	Speeds . . . . Three forward
Stroke . . . . . 4 1/2 inches	one reverse
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You know the tremendous success of the last  
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This new "Everitt 30" will surpass in every  
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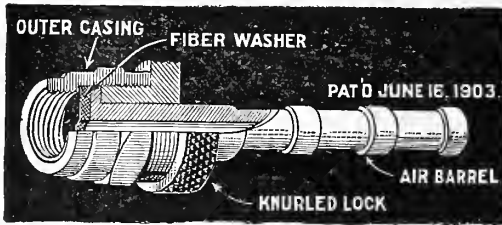
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Manufactured from solid brass rod. In three pieces, with fibre washer. HEAVY—SUBSTANTIAL—INDESTRUCTIBLE. Guaranteed for any pressure. For service and efficiency without an equal

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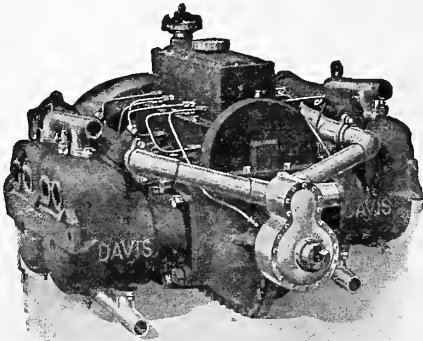
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Don't Use Any Old Motor  
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HERE'S AN ENGINE DESIGNED  
AND BUILT PURELY FOR  
TRUCK PURPOSES



4 cyl., 5½ x 5"

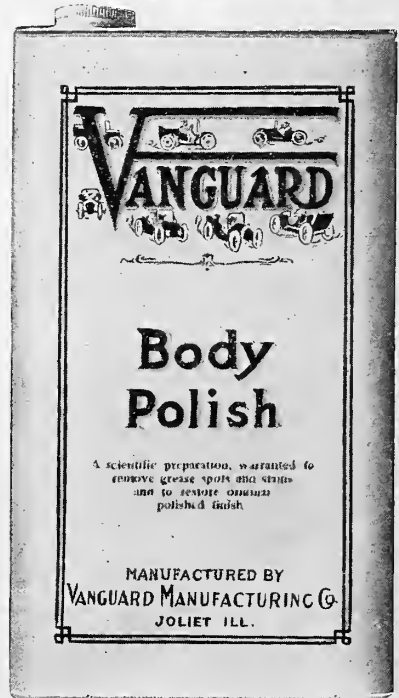
Has 2¼" crank shaft and is heavily built throughout. Guaranteed to stand the stresses and strains of commercial vehicle use.

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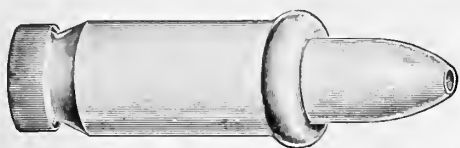
Send us your order. Our ample facilities will enable us to take care of it properly.

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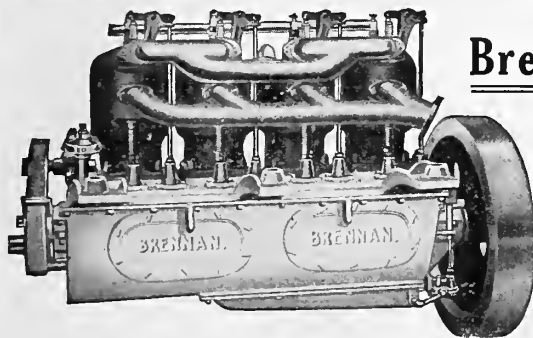
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**Brennan Standard Motors** are the best ever produced for automobile use. Years of satisfactory service are back of this statement. Try them and be convinced. They are great hill-climbers,—in fact that is their specialty.

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**The Buggyaut** is a buggy substitute and a touring car tender. For short trips and daily use by busy people.

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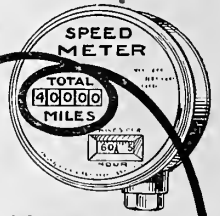
**The Delivery** combines great power with the simplest construction ever seen and is a money saver.

*Write me before you buy a light car*

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Few ever run a car far enough to wear out a **J-M Non-Burn Brake Lining**. Heat from friction—which is the greatest enemy of other linings—cannot char or burn **Non-Burn** because it is made of the long tough fibres of Asbestos, a mineral which even the flames of a blow torch will not burn. Neither has water, oil or gasoline any effect on Asbestos.



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is also reinforced in each strand with a fine brass wire, giving it exceptional tensile strength.

The Motor Car Renting Co., Boston, claim one **J-M Non-Burn Lining** is now wearing longer in their cars than twelve of any other lining ever used before.

Made to fit any brake or any friction or transmission clutch.

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Milwaukee	Minneapolis
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Philadelphia	Pittsburg
St. Louis	San Francisco
Seattle	(1072)

## Hele-Shaw Clutch

(Patented)

### Pressed Steel Self-Contained

Simple!	Efficient!
Durable!	The Best!

50,000 in use now on cars in the United States and abroad.

**"Star" Tire Case.**

**"Star" Baggage Carrier.**

**"Evans" Rear Axle and Transmission Front Axle.**

*Write for Catalog W*

### Merchant & Evans Co.

Philadelphia	New York	Chicago
Baltimore	Denver	

## Hayes Wheel Co. WHEELS Hayes Wheel Co.

**Q** We are the oldest Auto Wheel Builders in the country, and, having all new improved Auto Wheel Machinery, we are able to produce the most perfect wheel on the market. Kindly allow us to send you a sample set and also to explain our methods.

### HAYES WHEEL COMPANY, JACKSON, MICHIGAN

American Distributing Company, Sales Agent  
JACKSON, MICHIGAN



# SX MAGNETO

Simplest and most efficient apparatus.

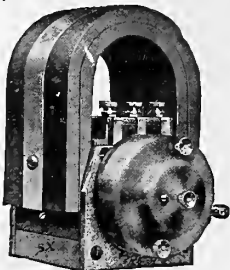
No half-time gears or shaft.

No distributor.

Not affected by moisture

Will operate at lower speed than any other magneto on the market.

We also make the



# SX IGNITION DRY CELLS

Amperage 30 to 35, and the best of it is they hold up and give longest life.

The SX products will help you to overcome your ignition troubles.

Make us prove it.

THE

**Lutz-Lockwood Mfg. Co.**

ALDENE, UNION COUNTY, N. J.

P. O., Roselle, N. J.

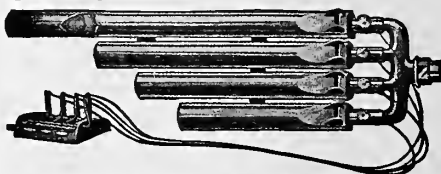
## YOU'RE ARRESTED!

No matter whether it is on the busy streets of the city or lonely stretches of country road, you are arrested by the sweet tones of a



## GABRIEL HORN

the Agreeable Signal which warns without frightening, which prevents accidents to passengers and pedestrians.



## THE GABRIEL TRUMPET HORN

the edition de luxe of Gabriel Horns.

## 1910 VALVE

Just like our reliable 1909 model, only made stronger throughout. Never sticks or gets out of order. For cut-out purposes remove disc in main channel. Agents wanted everywhere. Write for book.

## GABRIEL HORN MFG. CO.

Home Office and Factory

1412 E. 40th Street  
Cleveland, O.

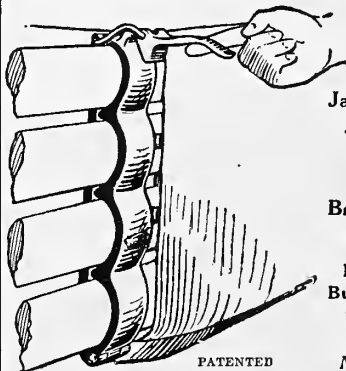
Branch

1926 Broadway  
New York City

## Don't Wait Till Your Top is Shabby

KEEP IT NEW BY USING

## The Bair Auto Top Holders



THEY POSITIVELY PREVENT

Jarring  
Jolting  
Chafing  
Rattling  
Broken Bows  
Spread Bows

No Straps or Buckles Needed (or bow-rests)

Easily Operated  
Never Out of Order

PATENTED

## Makes Your Top Last as Long as Your Car

Finished in Polished Brass and Black Enamel, and comes in three sizes, to fit 3, 4 or 5 bow-tops of any make machine. In ordering, mention finish and size wanted.

ASK YOUR DEALER OR WRITE

**The Auto Specialties Manufacturing Co., Inc.**

815 Unity Bldg.

Chicago, Illinois

## BREEZE "AUTOMATIC" CARBURETORS



AUTOMATIC

make good on any and all gasoline motors—none better for flexibility, power and economy—have spun metal float—central draught—large wearing parts—petcock for drainage—absolutely no tools necessary for adjustments; they stay set. Connections supplied.

Special Models for Ford Runabouts and Buick No. 10

Both our M. C. and A. A. Motorcycle Carburetors are especially adapted for motorcycle service—connected easily—standard equipment with Pierce, Yale—California, Greyhound, Crouch, etc.

M. C. and A. A. ....	\$10.00	Buick No. 10 .....	\$14.00
3" .....	10.00	1 1/2" .....	14.00
Ford Models N, R, S, T, .....	10.00	1 1/4" .....	18.00
1" .....	12.00	2" .....	34.00

Special light weight Strainer, \$1.00—prevents dirt, water, etc., entering carburetor, insures clean fuel. Our \$1.50 Strainer made of heavier stock, is larger in settling chamber area.

Check valves for two-cycle two-port engines—pass more gas than pipe will accommodate, hence do not cut down the motor power.

Ask your dealer or write us direct for descriptive pamphlet. All goods sold under special trial order guarantee.

## Breeze Carburetor Co.

250-252 South Street

NEWARK, N. J.



Fuel Strainer, \$1.50

# Special Automobile Parts

Transmissions, Differentials,  
Gear Blanks, Valve Stem  
Guides, Pumps, Fans and  
Clutches :: :: ::

We guarantee prompt delivery on Special  
Automobile Work at interesting prices.  
Our work is strictly first-class—Send us  
your blue prints. :: :: :: ::

**Niagara Machine Co.**

825 Linwood Avenue

Niagara Falls, N. Y.

# Buckeye Jacks

in all sizes



Suitable for any size and  
style Automobile made.  
For cars weighing from 500 to 8000 pounds.  
The largest variety of sizes made by any  
jack manufacturing company in America.

Style	Capac- ity	Height Bar Down	Rise of Bar	Height Bar Raised	Weight Pounds	Size of Base
No. 9	1 Ton	12"	6"	18"	9	3½x5½"
05	1 Ton	12"	6"	18"	9	3½x5½"
02	1 Ton	12"	6"	18"	8½	3 x 5½"
01	1 Ton	8½"	5"	13½"	8½	3 x 5½"
01	1 Ton	9½"	5"	14½"	8½	3½x5½"
03	1 Ton	10"	6"	16"	5	2½x4½"

**THE BUCKEYE JACK MFG. CO.**

ALLIANCE, OHIO

# NOONAN'S

## Auto Tools and Specialties

**THE BEST ON EARTH**

Chisels and Punches in Boxes or Leather Cases	Valve Spring Lifter
Cotter Pin Tools	Valve Truer
Bent and Straight End Screw Drivers	Tire Holders
Chain Repair Tools	Cast Aluminum Letters and Numbers

Every jobber should catalogue these  
tools. They are used by all dealers and  
repairmen. Send for catalogue and  
prices.

**A. S. NOONAN**

**Tool and Machine Works**

Rome, N. Y.

# 25,000 DIE CAST PARSONS' WHITE BRASS BEARINGS PER DAY

**T**HAT is our capacity with  
**OUR NEW BUILDING**  
and the bearings are better  
than ever.

This statement must appeal  
to the manufacturer who is  
trying to turn out engines and  
cannot get his material.


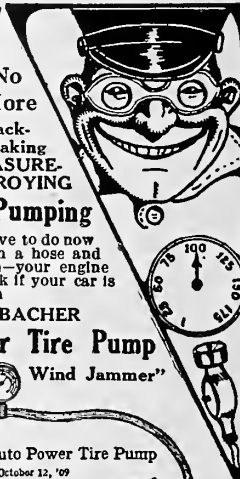
Inquiries accompanied by  
blue-prints always receive  
prompt and intelligent atten-  
tion.

**WETHERILL FINISHED CASTINGS CO.**  
Philadelphia, Penna.

**O**UR reputation as the largest producers of lamps in the world is sustained by every lamp leaving our factory.



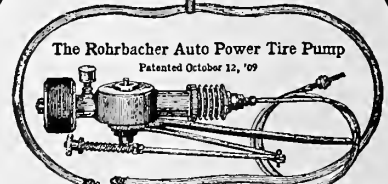
**EDMUNDS & JONES MFG. CO.**  
DETROIT, MICH.

**No More Back-Breaking PLEASURE-DESTROYING Hand Pumping**

All you have to do now is to attach a hose and turn a knob—your engine does the work if your car is equipped with

**ROHRBACHER Auto Power Tire Pump**  
"The Little Wind Jammer"



The Rohrbacher Auto Power Tire Pump  
Patented October 12, '09

Watch the gauge register the pressure in the tire. When desired pressure is reached, simply turn the knob again, detach hose and away you go. Can be installed in your car. Write for Illustrated Leaflet and name of nearest dealer.

**Rohrbacher Automatic Air Pump Company**  
173 E. Water Street, Portland, Oregon  
No Raising of Hood or Diving into Machinery

## *LaPorte* BODIES

First-class Bodies, either wood or metal, painted and upholstered complete.



We can furnish dashes in Mahogany, Walnut, etc., brass trimmed or plain.

**ROADSTER BODIES and AUTOMOBILE TOPS**  
A SPECIALTY



**LaPorte Carriage Co.**

LaPorte, Indiana

TRANSMISSIONS  
CLUTCHES  
CONTROL SETS,  
ETC.



*Catalogue and Prices on Application*

**GENERAL MFG. CO.**  
ELKHART, IND. Dept. A



# CASTINGS

IN { **ALUMINUM  
BRASS  
WHITE BRASS and  
BRONZES of all kinds**

**WE MAKE A SPECIALTY OF CONTRACT WORK OF ALL KINDS**  
**PIONEER BRASS WORKS, Indianapolis, Ind.**

# STAMPINGS

**In BRASS, ALUMINUM and STEEL**

¶ We are making Sector Brackets—Sector Ratchets, Wind Shield Supports, Pawls, etc., etc., to order. We can make any small article that can be stamped out of metal—Send us your blue prints.

—HIGH-GRADE BRASS PLATING—

**The Metal Specialty Company**

208-214 ELM STREET,

CINCINNATI, OHIO

# ARROW BRAND

**Chrome Nickel Steel Nickel Alloy (Titanium) Steel**

Forges and machines as readily as straight carbon steels.

Very uniform, free from seams and other defects.

POSSESSING GREAT PHYSICAL AND ANTI-FATIGUE QUALITIES.

**ARROW BRAND**

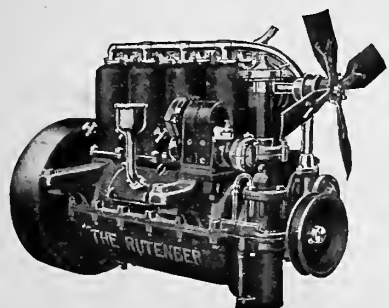
**Chrome Nickel Spring Steel**

**Titanium Spring Steel**

THE BEST SPRING STEELS OFFERED FOR HIGH-GRADE SPRINGS

Sole American Selling Agents

**JOHN A. CROWLEY & CO.,** 120 - 122 Liberty Street,  
New York, N. Y.



That's what they all say.  
What do they all say?

**RUTEMBER! RUTEMBER!**

Best material used in construction. Utmost care exercised in building. Thoroughly and carefully tested.

**FULLY GUARANTEED**

Known from coast to coast as best Motors on the market. On account of greatly increased capacity, we have a few Motors yet unsold. Very few. Write soon if you are interested.

4 Cylinder, 4 x 4, 25-28 H. P.  
4 Cylinder, 4½ x 5, 30-35 H. P.  
4 Cylinder, 4½ x 5, 40-45 H. P.

1910 Models Now Ready for Delivery.

May we send you further particulars and our Catalogue?

**Western Motor Company,** Logansport, Ind.  
Marion, Ind.

# BALL TRANSMISSION GEARS

FOR  
AUTOMOBILES

HIGHEST  
GRADE  
MOST  
RELIABLE



FOR  
COMMERCIAL VEHICLES

SIMPLEST  
EASIEST TO  
INSTALL

**NEW YORK GEAR WORKS, GREENPOINT AVENUE, NEAR WEST STREET, BROOKLYN, N. Y.**

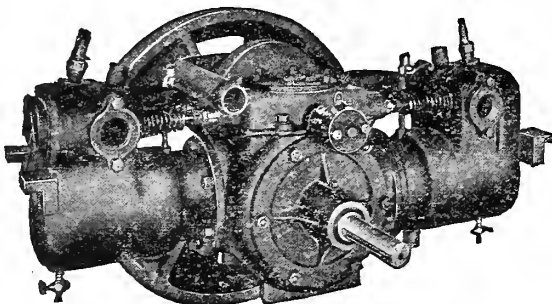


**SEAMLESS STEEL TUBING**  
ONLY TUBE MADE SUITABLE  
FOR BICYCLE CONSTRUCTION  
SEND FOR OUR ILLUSTRATED  
BOOKLET ON SEAMLESS TUBES  
NATIONAL TUBE COMPANY  
GENERAL OFFICES - FRICK BUILDING  
PITTSBURGH PA.

**Export Representatives:** U. S. STEEL PRODUCTS EXPORT CO., New York City

For the convenience of customers desiring immediate delivery, stocks of Shelby Seamless Steel Tubing are kept in many large cities; the location of stock nearest to any specific point will be advised on request.

**District Sales Offices:**  
ATLANTA  
CHICAGO  
DENVER  
NEW ORLEANS  
NEW YORK  
PHILADELPHIA  
PITTSBURGH  
PORTLAND  
SAN FRANCISCO  
ST. LOUIS  
SALT LAKE CITY  
SEATTLE



## THE "CENTURY" WATER COOLED ENGINE

is built of the highest grades of material obtainable, by expert workmen. The operating results will be **satisfactory to you.**  
Let us know your requirements.

*Manufactured by*  
**CENTURY ELECTRIC CO.**  
19th and Olive Sts. - St. Louis, Mo.

4-inch dia., 5-inch stroke, 16 B. H. P.

# BOSTON GEARS



## AUTOMOBILE HARDENED

**Steel Gears Our Specialty**

**TRANSMISSION Differential Timer  
and Steering Device Gears. :::**

**BOSTON GEAR WORKS :: NORFOLK DOWNS, MASS.**

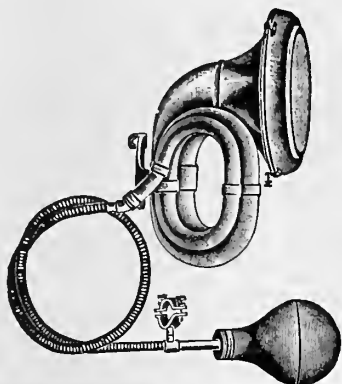
A house where the trade can get what they want in  
**AUTOMOBILE, MOTOR AND BICYCLE SUPPLIES**  
 when they want them, at right prices

## MANUFACTURERS' SUPPLIES CO.

JOBBER AND IMPORTERS

418 ARCH STREET

PHILADELPHIA, PA.



OUR HORN No. 12, round or oval bell, made of the very best material, has all the requisites of high-grade goods.

Its features will add a great deal to the beauty of your car, and its long reaching tone will avoid many an accident.

**NEW YORK AUTO LAMP COMPANY**

MANUFACTURERS OF

**Auto Horns, Lamps and Generators**

419 to 431 E. EIGHTH STREET . . . NEW YORK

## Oberdorfer Type "B" Pumps for Gray Motor Co.

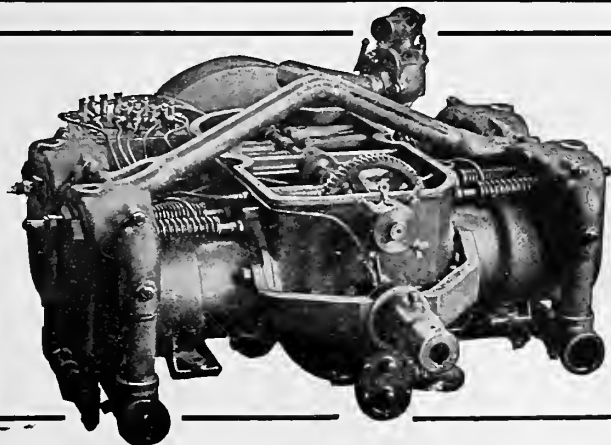
5,000 for 1909

10,000 for 1910

==NUF SED==

WRITE FOR CATALOG

**M. L. Oberdorfer Brass Company, Syracuse, N. Y.**



4-cyl., 5½" x 5"

### FOR TRUCKS

Easily accessible. Cut shows cover removed.

MADE ALSO IN 2-Cylinder

We also manufacture  
**PLANETARY TRANSMISSIONS**

**Quick Delivery !!**

Get Catalogue "B"

**ANDERSON MOTOR CO.**

16th & Jackson Sts.  
**ANDERSON, INDIANA**

## THIS DEVICE WILL SAVE ONE-THIRD YOUR FUEL On Any Gas, Gasoline, Kerosene or Distillate Engine

"The Hotter the Spark the Better the Combustion," is a well-known principle of Gas Engineering. Spark Coils eat up current, and thereby cause endless expense and trouble—just when needed the most. Poor ignition from batteries causes misfires, slow ignition or combustion and thereby increase your fuel expense by one-third to one-half. You can save this wasted fuel, get the maximum power, by installing

### THE MOTSINGER AUTO-SPARKER

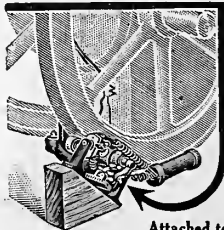
No Battery Needed to Start the Engine.

Delivers a white-hot spark for a lifetime. This device is a simple fool-proof dynamo. It will continuously deliver an intensely hot spark with from 3 to 15 volts behind it (adjustable to suit). We don't know how long the Auto-sparker will last, for those put out ten years ago are still "delivering the juice"—few have required repairs or replacements. See your dealer or write direct for prices and money-saving details. Learn how to run your engine for one-half to one-third your present cost; also how to charge storage batteries for ignition and lights.

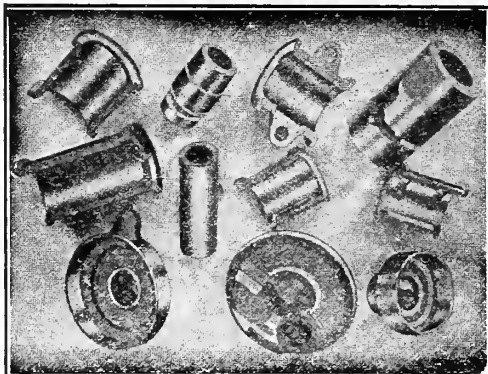
TO DEALERS—The demand from those operating internal combustion engines of all kinds is so constant and certain that you can safely stock the Auto-sparker. We protect you against loss by GUARANTEEING THE SALE. Ask us about it.

MOTSINGER DEVICE MFG. CO.,

Box 373, Pendleton, Ind.



Attached to  
Stationary Gas Engines



### Finished Metal Castings of Superior Tensile Strength from Superior Alloys

Thirty Years' Experience in Compounding Alloys

Finished Die Moulded Bearing Bushings for Gasoline Engines our Specialty; also Timer Parts—in fact, everything that you are now using cast from brass. Our Die Castings need no filing, fitting or machining, but are ready for assembly when leaving our factory. Manufactured by our new and improved vacuum process.

### E.B. VanWagner Mfg. Company

Manufacturers of  
Finished Metal Castings of Superior Tensile Strength  
SYRACUSE, N. Y.



\$1.00, Complete

## Peerless Tire Repair Kit

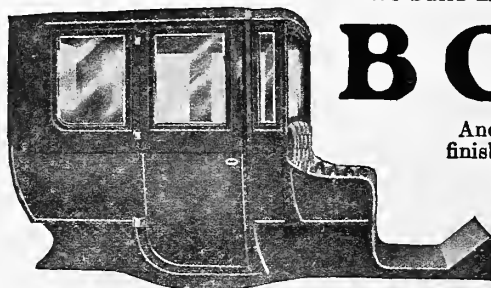
For making instantaneous and permanent repairs on bursted or torn Outer Casings and Inner Tubes.

Requires no heat, as Cement and Vulcanizing Solution unites patch and torn parts into one solid piece of rubber that cannot be separated without tearing.

Get same from your dealer or direct by Express, Prepaid on receipt of price.

SAMPLE DEMONSTRATION FREE

THE PEERLESS CEMENT CO. ∴ Akron, Ohio



No. 556. 7-Passenger Brougham Body

We build first-class Aluminum, Steel or Wood

## BODIES

And furnish them in the white, or finished complete, ready to mount.

### Taxicabs ARE A SPECIALTY

LET US FIGURE WITH YOU

The Barndt-Johnston AUTO SUPPLY Co.  
412 Donaldson St., COLUMBUS, Ohio

# BROGA FASTENER



Interior View

FOR Automobile, Carriage and Yacht  
Curtains, also Leggings, Coats, Floor  
Mats, etc.

Pat. in U. S. A. & Foreign Countries

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**Broga Automatic Fastener Company**  
Manufacturers & Distributor  
370 W. Fayette St., Syracuse, N. Y.

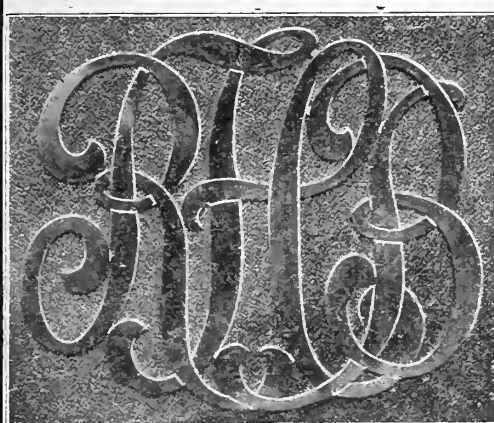
Would You  
take such chances  
with other polishes?  
Protect yourself  
by using



**NON-EXPLOSIVE  
NEW JERSEY  
LIQUID  
METAL POLISH**

No Evaporation  
No Acid  
No Alkali  
No Water  
No Benzine

**New Jersey Paint Works**  
H. LOUDERBOUGH, Prop.  
Jersey City, N. J., U. S. A.



## Name Plates, Monograms and Initials

— for —

Radiators and Doors of Auto-  
mobiles, Motor Boats, Canoes, etc.

Special prices to manufacturers in small  
or large quantities.

We do the designing.

**THE HICKOK MFG. CO.**  
ROCHESTER, N. Y.

## Automobile Steels

for immediate  
Delivery



We are prepared  
to make prompt  
delivery of the  
following high-  
grade straight car-  
bon and special  
alloy steels, for

automobile purposes, in bars, billets, shapes and  
forgings:—

High carbon steels of all classes

3 1/2% Nickel

5% "

25% "

Nickel-Wolfram

Chrome-Nickel

Chrome-Carbon

Chrome-Nickel-Vanadium

Nickel-Wolfram-Vanadium

Chrome-Nickel-Titanium

Nickel-Wolfram-Titanium

Ball and Ball Bearing Steels

3 1/2% and 5% Nickel Steel Seamless Tubing

High Carbon Seamless Steel Tubing

"Modern" and "Unus" High Speed Steel

Tool Steels of all grades

All our products are made from pure Swedish Irons only  
and melted in electric furnaces, insuring low sulphur and  
phosphorus, and absolute uniformity in physical and  
chemical properties.

**BECKER STEEL COMPANY**

Land Title Building

Philadelphia

Sole Agents of the  
**STAHLWERK BECKER, A. G.,**  
Krefeld, Germany

THE 1910  
*Lexington*

\$2500 and  
\$1650



¶ The LEXINGTON is one of the successes of the season. It has gained a reputation for reliability second to no other car selling for the same price.

¶ The dealer who wants a quick seller, at a popular figure, will do well to get our proposition at once. The \$1650.00 proposition is a new addition to the Lexington Family, which has never been less than \$2500.00, but the same values will be maintained in the cheaper priced car as in its larger \$2500 brother

¶ Deliveries commencing now. We will move into our fine new factory at Connersville, Ind., Jan. 15th, where our facilities for making prompt deliveries will be greatly increased.

**The Lexington Motor Car Co., Inc.**  
LEXINGTON, KY.

## Buy a 1910 "Kenmore"

**DIRECT FROM FACTORY**

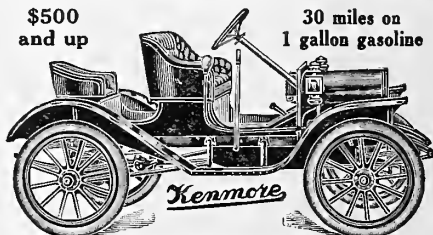
*For Business or Pleasure*

**Speedy — Roomy — Strong — Handsome**

A real Automobile with plenty of power to climb hills and go through sand or mud. Always ready — always safe. Economical and easy to operate.

**\$500  
and up**

**30 miles on  
1 gallon gasoline**



**Absolutely Guaranteed**

Designed and built to meet the severest requirements of city or country service. An ideal car for physicians. Take off detachable rear tool box and Rumble seat and have business automobile for merchants, farmers, salesmen, poultrymen, dairymen, etc. Best material and workmanship. Solid, cushion or pneumatic tires. Powerful motor under Hood. Shaft drive. Ball and roller bearings, roomy body, comfortable seats, fine finish.

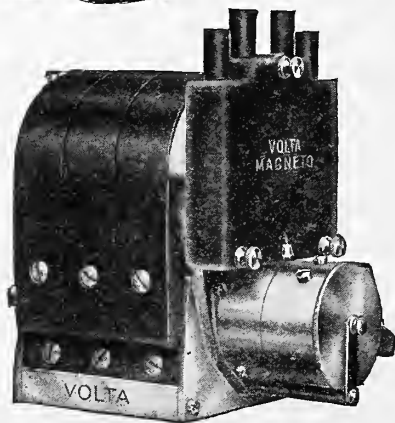
**The Automobile You've Waited For**

Write today for illustrated circular and terms to Agents and Dealers. Do it now. Address

**KENMORE MFG. CO.**

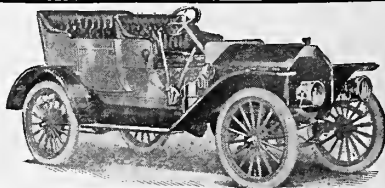
324 B Gaff Bldg., Chicago, Ill.

# VOLTA



The high tension magneto that every motorist wants when he learns what it will do.

**BUFFALO IGNITION COMPANY**  
BUFFALO, N. Y.



*McIntyre*

30 horse-power, 112-inch wheel base

**\$1500**

36x3½-inch pneumatic tires. Splitdorf magneto, shaft drive, selective sliding gear transmission

**W.H. McINTYRE COMPANY**

Auburn, Ind.

Licensed Under Selden Patent.

1730 Grand Avenue 418 Third Ave., So.  
Kansas City Minneapolis, Minn.

Canadian Factory, Tudhope-McIntyre Co.  
Orillia, Ontario



# IF YOU ARE INTERESTED IN OXYGEN-WELDING

YOU SHOULD KNOW ABOUT THE  
**LAVOISITE-SYSTEM**

WRITE FOR PARTICULARS

OF  
**LAVOISITE**  
TO

**Arnold, Hoffman & Co., Inc.**  
PROVIDENCE PHILADELPHIA NEW YORK BOSTON  
CHARLOTTE, N. C.

OF  
**APPARATUS**  
TO

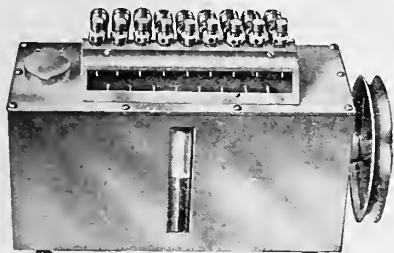
**H. W. DOPP COMPANY**  
BUFFALO *Manufacturing Engineers* NEW YORK

If now using Oxygen we can save you money. When writing advise kind and quantity used per day.

## Not "How Much" but "How Little Oil" Do You Use? The "Sherwood" Force Sight Feed Oil Pump

Insures **PERFECT LUBRICATION**  
With the **LEAST** Quantity of Oil

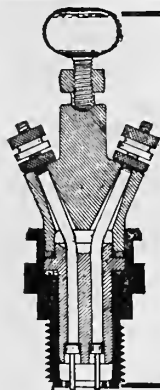
A **POSITIVE** oil supply for **EACH SIGHT-FEED**.  
An **ACCURATE** feed adjustment—**ONE THAT STAYS**.  
Capacity—Number of Feeds—Location of Drive:  
**TO MEET ALL REQUIREMENTS.**



Model "F"

Write for Catalogue

Manufactured by  
**Sherwood Manufacturing Company, Buffalo, N. Y.**



**Don't Use Two Spark Plugs** on each cylinder of your engine. To get the proper double system of ignition use the **SUPERIOR DOUBLE SPARK PLUG**; one side for Magneto, the other for Battery. Place it over inlet valve where sparking points become red hot. long, which keep them clean and cool. A spark plug over or near the exhaust becomes sooty, foul and red hot.

**The Superior Double Plug** is the only spark for the double system of ignition. Note the great advantage over the old-time single plugs. Taken apart without use of tools and without removing socket from the cylinder. The socket is a splendid priming cup. Our double "Permette" gaskets prevent any leakage. By turning points around a little, two fresh sparking points are exposed.

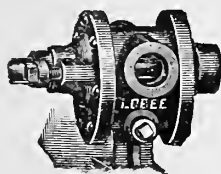
No leaking at cylinder threads by constantly taking out socket.

After you try a set of Superior Double Plugs you will wonder how you got along without it. If your dealer has not got it, ask us.

Price, \$1.50 Extra Porcelains, Complete, 50c

**Superior Motor Specialty Company**

526 Jefferson Street, Philadelphia, Pa.

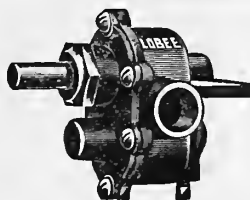


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## Lobee Circulating and Bilge Pumps

have a train of satisfied users everywhere. If you want good circulation on your Automobile, Launch or Motor Boat, use a **Lobee Pump**.

Write for circular and prices.



**LOBEE PUMP AND MACHINERY CO.**

**127-137 Terrace, Buffalo, New York**

For Sale and Carried in Stock by Chas. E. Miller, F.O.B. the following branches:

97-101 Reade St., New York; 318 N. Broad St., Phila., Pa.; 1829 Euclid Ave., Cleveland, O.; 227 Jefferson Ave.; Detroit, Mich.; 924 Eighth Ave., New York; 202 Columbus Ave., Boston, Mass.; 1392 Bedford Ave., Brooklyn, N. Y.; 274 Trumbull St., Hartford, Conn.; 66 Edgewood Ave., Atlanta, Ga.



# "RAJAH" SPARK PLUGS

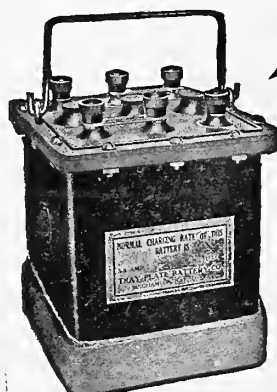
IGNITION ABSOLUTELY SURE

**RAJAH AUTO SUPPLY COMPANY**

**BLOOMFIELD, N. J.**

(Watsessing Station, D. L. & W. R. R.)

John Millen & Son, Ltd.—Montreal—Toronto—Vancouver



6 Volts, 60 Amperes

"High Efficiency"  
"Something Good"  
"High Efficiency Batteries"

Actually Give

**Greater Results and Hotter Spark**

than other batteries

1200 to 1500 Miles on Our No. 660

1902  
1909

**TRAY PLATE BATTERY COMPANY**

1902  
1909

24 Wall St., Binghamton, N. Y.

## YOU CAN'T GO WRONG

If you will use our Running Gears, Wheels, Axles, Bodies and other parts. We make single or double chain drive, also shaft drive running gears with wheel base up to 138 inches.

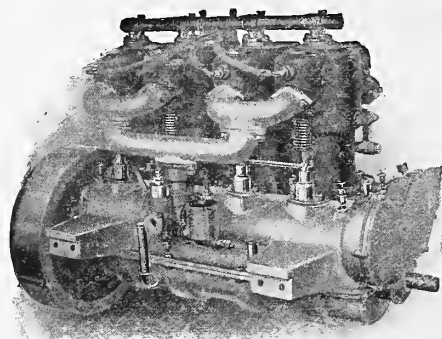


**Our Prices will Interest You**

We also make bodies, wheels, axles, steering devices and cars ready for power.

Write for our new catalog at once.

**BORBEIN AUTO CO.,** 2109-11 N. 9th St.  
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## Schlosser Mfg. Co. MOTORS

Individual Cylinders. Jump Spark Ignition.  
New Double Jet Carburetor. Unusually Big  
Bearings. Perfect Workmanship and Finish.

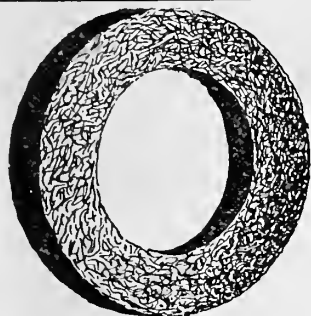
**OTHER SIZES FOR ALL PURPOSES**

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**OFFICE AND FACTORY:**

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24-30 AUTOMOBILE TYPE, 4½ in. x 6 in.



TRADE MARK

## GEO. W. BRAUNSDORF

Manufacturer of

### Felt Packings for Automobiles

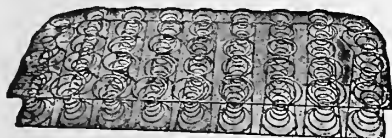
MY SPECIALTY

Dust Rings for the Hubs. Strips for Crank Cases. Washers  
for All Lubricating and Dust Excluding Purposes

*Submit Samples for Estimate*

Prompt Shipment of All Orders Is Assured

Office and Factory: 305-7-9 E. 43d St., New York



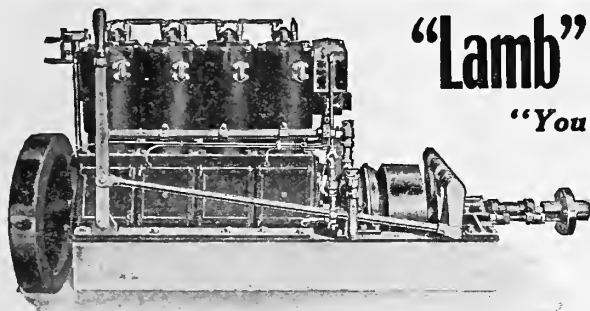
### Soft Edge Cushion Springs

Used on the majority of high-grade automobiles on the market today. They have won and maintained a premier position solely through MERIT.

The high-grade materials used in their manufacture insure durability and the double cone construction makes them of extraordinary resilience.

*Let us figure with you on your requirements.*

National Spring & Wire Co., Albion, Mich., St. Catharines, Ont.



## "Lamb" Marine Motors

*"You know the Engine"*

Medium Duty

2 Cylinder, 12 h. p.    4 Cylinder, 24 h. p.  
3 Cylinder, 18 h. p.    6 Cylinder, 40 h. p.

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2 Cylinder, 30 h. p.    4 Cylinder, 40 h. p.  
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Also Small Sizes in the Two Cycle Type

Catalog Free

**Lamb Boat & Engine Co.**

1800 4th Street, Clinton, Iowa

24 h. p. 4-Cylinder "Lamb"

## HAZARD MOTOR POWER PLANTS

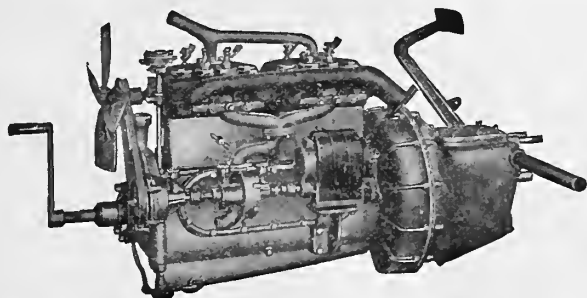
Motor, Disc Clutch and  
Transmission  
IN ONE UNIT

**SIMPLE  
POWERFUL  
LIGHT**

Write for Circular

**HAZARD ENGINEERING COMPANY**  
ROCHESTER, N. Y.

Dept. J



☐ Selective type transmission, 20 and 30 horse, three speeds forward—one reverse.

- ☐ Planetary transmission, 24 horse Power.
- ☐ "Giant" steering gear, 4000 lb. cars.
- ☐ "Little Giant" steering gear, 2500 lb. cars.
- ☐ "Buggyabout" inside control, 1500 lb. cars.
- ☐ "Buggyabout" outside control, 1000 lb. cars.
- ☐ Universal joints, No. one, 18 horse or less; No. two, 40 horse power.
- ☐ No. one—one-half, 25 horse power; these joints are self-lubricating and dust-proof.
- ☐ Our "Non-Swell" silent running filled gears for cam shafts, pump and Magneto drive cannot be beat.
- ☐ Blue prints and other particulars will be furnished on application.

ADDRESS

**Widmer Machine Works**

Detroit, Michigan and New York

## A Genuine Diamond

Costs more than an imitation  
IT'S WORTH THE DIFFERENCE

## A Genuine Gray Muffler



"SILENT AS THE SPHINX"

Costs but little more than its imitations, and there is as much difference in quality as there is between a genuine and an imitation diamond.

Fifty-five of the leading motor car manufacturers are using the Genuine Gray Muffler.

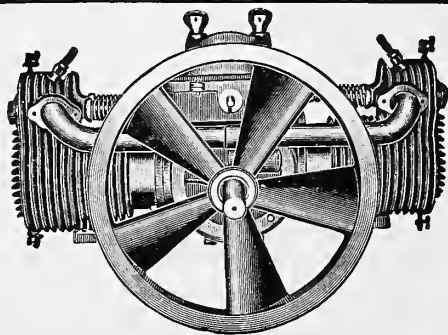
## They Know "It's good if made by GRAY-HAWLEY"

We have facilities for carload lots, but appreciate and give the same careful attention to single orders.

Write for catalogue T. J. It describes our entire line of Mufflers, Cut-out Valves, Foot Pedals, and the celebrated "Gray Autochime," the Aristocrat of exhaust signals.

**GRAY-HAWLEY MFG. CO.**  
DETROIT, MICH.

OUR Marine Catalogue describes a complete line of Whistles, Compressors, Fog Bells, Gasoline Filters, etc. Free for the asking.



## OPPOSED TYPE MOTORS

built in sizes  $4\frac{1}{2} \times 4\frac{1}{2}$ ,  $4\frac{3}{4} \times 4\frac{3}{4}$ ,  
 $5 \times 4\frac{3}{4}$  and  $5 \times 5$ , air or water  
cooled.

*Catalogue for the asking*

**MONARCH MOTOR MFG. CO.**  
3145 N. Halsted St., Chicago

## STRENGTH AND LONG LIFE



The two principal requirements of dry cells are featured in the batteries of our manufacture.

THE UNION is a cell constructed to withstand the hardest kind of usage—its service as an ignition battery has won it merits. Boxed

in both square and round cartons.

THE NUE dry cell has a high amperage with a low internal resistance and with proper handling will outlast any other cell on the market.

**FLASH-LIGHTS and ELECTRIC NOVELTIES.** *Send for booklets.*

**UNION BATTERY CO.**  
BELLEVILLE, N. J.



# B. K. F. Ball Bearings

SOLE AMERICAN AGENTS

**J. H. LEHMAN MFG. COMPANY, Inc.**

MANUFACTURERS OF

The "Lehman" Distributors, Timers & Spark Plugs

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**GUARANTEED FOR LIFE  
AGAINST DEFECTS AND CLOGGING UP  
HONEYCOMB SQUARE CELL**

**El Arco Radiators**  
CURE OVER-HEATING  
**EL ARCO RADIATOR CO.**

(FORMERLY LIVINGSTON RADIATOR COMPANY)

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**SPECIFY**

**Superior Babbitt**  
FOR YOUR  
**DIE CAST BEARINGS**

USED IN LEADING CARS. HANDLED BY PRINCIPAL DIE CASTERS

MADE ONLY BY

**CLUM & ATKINSON, ROCHESTER, N. Y.**

**MY PRICES on BRAZED and CAST CONNECTIONS**



Type 1



2



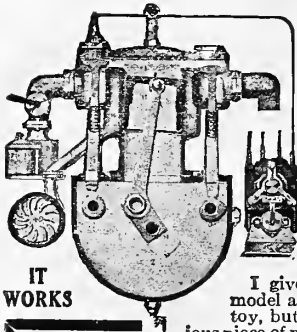
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4

**DEMAND your ORDERS**

B. Morgan, Beach St., Newport, R. I.  
Mfr. of Auto Necessities



IT  
WORKS

## Gas Engine Model FREE

I give you this wonderful model absolutely free. Not a toy, but a marvelously ingenious piece of machinery that teaches you more about the automobile gas engine than you could learn around a car in years. Every part is there, and it actually works. The piston goes through the complete cycle, operating the valves by means of the crank shaft and the half time gears, exactly like a full-sized engine. Equally practical models of the magneto and carburetor also given free. You can

### Learn Automobile Engineering

including driving, locating trouble, timing valves and ignition more thoroughly and easily with these models than by attending a resident school or through any amount of experience. If you want to be the master of your own automobile or become a chauffeur, repairman or gas engine salesman, **write me today** for full particulars about these wonderful models and how I give them to you absolutely free.

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1400 New Bank of Commerce Bldg.  
ST. LOUIS, MO.

## AUTO SPRINGS

FROM  
CRUCIBLE  
KRUPP  
VANADIUM  
STEEL



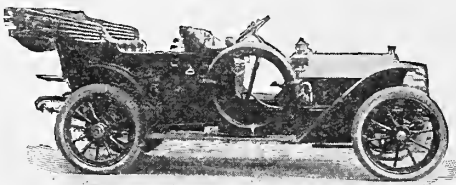
Semi-Elliptic

Any Type to Order

THE  
**Perfection Spring Co.**

CLEVELAND, OHIO

## “SHARP ARROW”



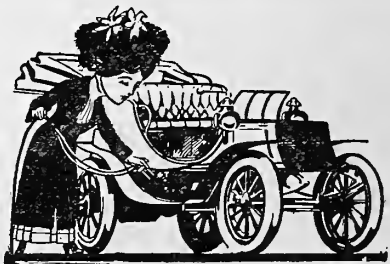
**\$3000** does not represent the real worth of this **High Class Touring Car**. No other car offers any better engineering features and very few cars embody such an assemblage of high-grade materials.

**SHARP ARROW**, with its **40 H. P. motor**, has demonstrated that it is rightly powered, actually performing in the hands of our customers with as good showing of endurance and speed as was made in its brilliant racing exhibitions.

**SHARP ARROW** holds the records for sustained speed in long distance road racing for **1908 and 1909**; in the Long Island Automobile Derby, September 20, 1909, making the fastest time yet accomplished by any American stock car for a distance of over two hundred miles, easily

Doing 205.2 Miles in 190 Minutes  
Averaging 64.8 Miles an Hour

OFFICE AND FACTORY - TRENTON, N. J.



**Convenience**  
Combined with  
**Economy**

It is but the work of a moment to attach the batteries of your car to

### The Westinghouse Battery Charging Outfit

It will charge the batteries just right without any further attention on your part, and cut off automatically as soon as they are completely charged. You can go to bed feeling sure that your car will be ready for use, with the batteries fully charged, in the morning.

Address Westinghouse Bureau of Publicity,  
Pittsburg, Pa., for Circular No. 548

**Westinghouse Electric & Mfg. Co.**  
Pittsburgh, Pa.

## Wellington "Automatic" Torch

for Automobile Manufacturers, Owners, Garages, Electricians, Plumbers, Gas Fitters, Tinsmiths, Car Builders, Railroads, Machinists, etc., etc.

For Soldering, Brazing, Tempering, etc.



Flame can be regulated to any desired size by simply turning a screw, thus keeping the heat constantly under complete control.

Can be used in any position, bottom up or otherwise. Does not get hot; always cold.

The Wellington Automatic is the most efficient Gasoline Torch on the market.

**ARTHUR T. RUTTER & CO.**  
256-7 Broadway     ::     NEW YORK

## SOME CAR OWNERS

have tire troubles. Others own and carry with them a **Little Wonder Vulcanizer**



## SOME CAR OWNERS

pay too much for auto supplies. Others ask for our auto supply catalogue, send us their orders and save money. We are the one firm who ship from stock the day your order is received. Try us. Ask for Auto Supply Catalogue. *Electric Vulcanizers. Alcohol Heat Vulcanizers. Gas Heat Vulcanizers.* Prices low. Goods guaranteed.

**Rice & Dayton Mfg. Co.**  
CEDAR FALLS, IOWA



## Rivets and Escutcheon Pins

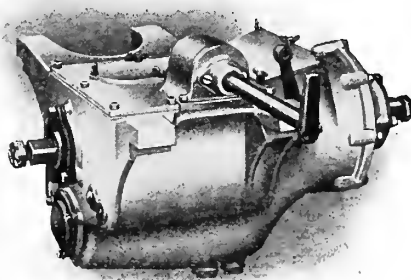
Made in  
All Metals  
and  
Plated in  
All Finishes

**JOHN HASSALL, Inc.**  
No. 411 Oakland St., Brooklyn, N. Y.

ESTABLISHED  
1850

## 1910 TRANSMISSIONS AND PARTS

"QUALITY SPEAKS FOR ITSELF"



"SELECTIVE SLIDING"—35 and 50 H. P.

## Unit Power Transmissions

The Multiple Disc Clutches are made from tempered saw steel and run in oil in separate compartment. Gears are made from Chrome Vanadium Steel. We also furnish control levers. We build a variety of both spur and bevel types of differentials. Our steering gears are built to stand up under all conditions.

**WARNER GEAR CO. - MUNCIE, IND.**

# ROBES

Light Weight for Spring

We have 8 big  
sellers, auto size,  
\$13.80 for the 8.

Write for List and  
Description. : : : :

**Hugh Wallace Co.**  
**Detroit, Mich.**

The Largest Robe and Coat Makers

**BAILEY'S**  
**CROWN METAL**  
**POLISH**

APPROVED AND USED  
BY THE  
UNITED STATES  
GOVERNMENT

A  
PINK  
OIL  
CREAM  
POLISH

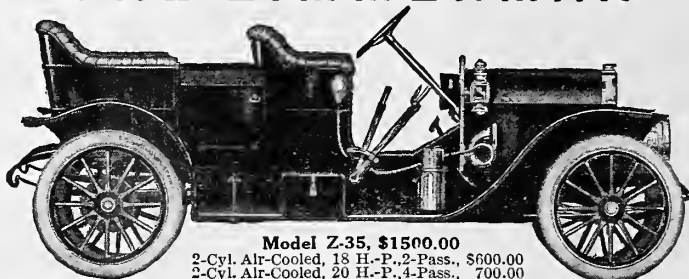
**BAILEY'S CROWN METAL POLISH**  
**CREAM**  
NICKEL BRASS COPPER ZINC STEEL  
TIN GOLD AND SILVER  
THE CROWN MFG. CO.  
Indianapolis Ind. U.S.A.

USED BY THE LARGEST AUTO MANUFACTURERS & GARAGES  
CLEANS & POLISHES INSTANTLY AND LEAVES  
NO POWDER OR SEDIMENT. YOU WILL LIKE IT  
ASK YOUR JOBBER OR WRITE US FOR SAMPLE  
5 & 10 GALLON CANS FOR GARAGE USE - ALL SIZES FOR RETAIL TRADE.

**CROWN MFG. CO., INDIANAPOLIS, IND., U.S.A.**

## THE ZIMMERMAN

4-Cylinder  
Water Cooled  
5-Passenger



THE CAR  
OF  
QUALITY,

Model Z-35, \$1500.00  
2-Cyl. Air-Cooled, 18 H.-P., 2-Pass., \$600.00  
2-Cyl. Air-Cooled, 20 H.-P., 4-Pass., 700.00

A full line of good sellers. Can take on only a few more agencies this season. Do you want the agency for your county? Write us for particulars. **Zimmerman Mfg. Co., 441 Indiana Ave., Auburn, Indiana, U.S.A.**

*Any Name Any Color*

If you are a Dealer and would like to know of a money-making plan that is a little out of the beaten path—

If you want batteries to give you less care and more profit—  
Just write us a postal saying, "Any Name, Any Color."

**MOTOR CAR SUPPLY CO.**

1461 MICHIGAN AVE., CHICAGO

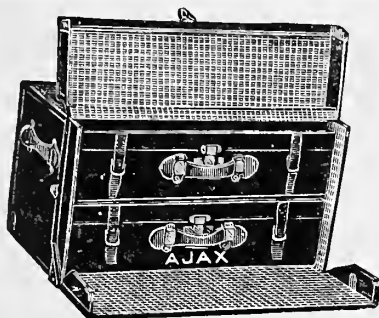


One of our 25 styles of  
"1910"

## Auto Trunks

Contains two very roomy  
suit cases to match trunks.

Price to the Trade,  
**\$15.00 Net**



Our New No. 450

## "Ajax" Auto Trunks

**Ajax Trunk and  
Sample Case Co.**

91-93 Mercer St., N. Y.

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## RUBBER GOGGLES

IN LARGE VARIETY  
**Cover Rubber Goggles**

Patented July 30th, 1907  
June 16th, 1908  
March 2d, 1909

**Beware of Rubber Goggles not protect-  
ed by COVER patents**

New Catalogue upon application to any jobber  
**SUSSFELD, LORSCH & COMPANY**  
37 and 39 MAIDEN LANE, NEW YORK



**ESTABLISHES  
NEW WORLD'S  
STOCK CAR  
RECORD**

At Los Angeles, March 6th, the **Corbin** won the 50-mile open  
race for stock cars on a mile dirt track in 50 minutes, 26 seconds  
—a new world's record.

This same car, a regular stock model, in the hands of a private  
owner and in competition with a large field, including several  
factory racing teams, also won the 5- and 25-mile open events.

Thus the **Corbin** adds supremacy on the track to its long  
list of hill climbing and endurance run victories.

You will find our 1910 Catalogue C very interesting.

**Corbin Motor Vehicle Corporation**  
New Britain, Connecticut

Licensed under Selden Patent.

## Oliver's Marvel Jack

A revelation in Jacks. Only four  
pieces of the best quality malleable  
iron, put together and securely  
fastened with one stroke of the  
hammer, without a bolt, screw, rivet  
or spring.

It has a worm gear; is quickly ad-  
justed to any height, and raises or  
lowers automatically as rapidly as  
a screw jack.

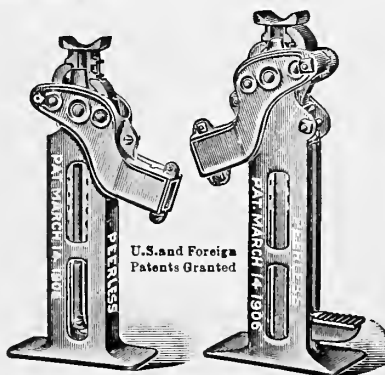
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**OLIVER MFG. CO.**

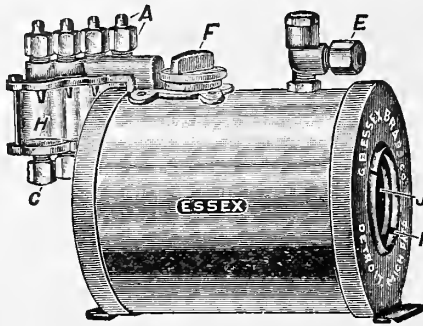
Makers of the Famous Peerless Jacks  
325 S. DESPLAINES ST.  
Chicago



MARVEL



PEERLESS



# Automatic

Lubrication is the only successful method of lubricating Automobiles. Always ready and never gets out of order. 75,000 in use.

**G. B. ESSEX BRASS CO.**  
DETROIT, MICH.



## To Every Owner of a Vehicle !

The time for washing vehicles is at hand; use the "IDEAL" Carriage Washer and save the nice finish on your car.

**Price, without Sponge, \$1.50. Price, with Sponge, \$2.00.**

Our "IDEAL" OVERHEAD WASH FOUNT is superior to any other. Sent on 10 days' free trial to responsible parties.

**Price, plain, \$12.00. Equipped with electric light, \$20.00.**

"IDEAL" AUTOMATIC WATER SAVERS prevent the waste of water; guaranteed to cut the water bill in half.

Pat., Aug. 11, '08.

"Ideal" Automatic Water Saver



Good discount to the trade.

Ask for catalog G.

**"IDEAL" Carriage Washer & Automatic Water Saver Co.**

Rochester, N. Y., U. S. A.



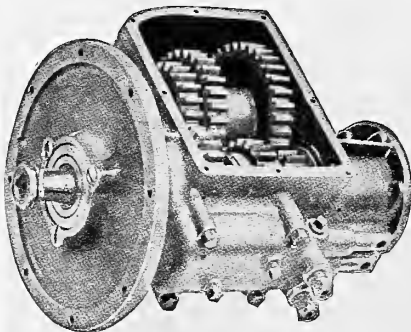
# SOLID CAM SHAFTS



They are all coming to it, and so will you—if you have not already. The solid shaft is better and costs no more than the assembled kind. Our workmanship is unsurpassed and our deliveries good.

**WE ALSO GRIND CRANK SHAFTS**

**MUSKEGON MOTOR SPECIALTIES COMPANY, Muskegon, Michigan**



**WARNER MFG. CO.**

**TOLEDO, OHIO**

**STEERING GEARS  
TRANSMISSIONS  
DIFFERENTIALS**

**T. W. WARNER CO.**

**MUNCIE, INDIANA**

**GEAR SHIFT LEVERS**

# Sheet Metal Stamping *for Automobiles*

Brake Drums, Wheel Flanges, Hub Caps, Ball Cups and Retainers, Hood Supports, Step Hangers, Brake Bands, Gear Covers, Universal Joint Covers, Clutch Discs.

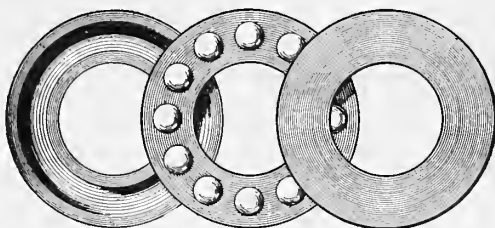
These are only a few of the principal parts we make for automobiles.

**The Crosby Company, Buffalo, N. Y.**



**THE  
STAR  
BALL  
RETAINER  
CO.**

Lancaster, Pa., U.S.A.



**Complete Thrust Bearing**



**Radial Retainers**

**Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.**

# Tire Expenses are Lion-Like in Size



They gobble up your dollars as fast as the King of Beasts gobbles down anybody that looks digestible. ¶ Ordinary Rubber Cements are supposed to withstand 80 degrees of heat; some do—some don't. ¶ Friction often generates 90 degrees of heat between INNER TUBE AND OUTER CASINGS—

## That's Why an Ordinary Cement Patch Melts Off

Inner Tube punctures repaired instantly, on the road or at home. For M. & M. is instantaneous, positive and self-vulcanizing. Easily carried in your tool chest. ¶ Why bother with imitations? A complete M. & M. Outfit only costs \$1.00 and saves 90% of tire expenses. ¶ For sale at all Automobile Dealers and Jobbers, or sent direct upon receipt of price. Manufactured by

**THE M. & M. MFG. CO., AKRON, OHIO**

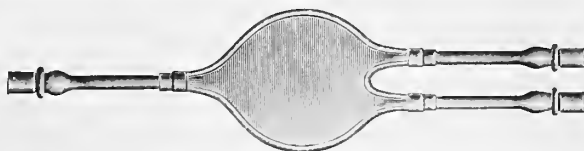
P. S.—Send for circulars describing KNEAD-IT. The new preparation for filling curb cuts in outer casings. Prevent that blow-out.

**Clincher Bicycle  
and Motorcycle**

# TIRES

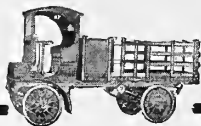
**For Single and  
Double Clinch Rims**

**Rubber  
Gas Bags  
Tubing**



**Lamp  
Connections  
Tire Patches  
and Tape**

**INDIANA RUBBER AND INSULATED WIRE COMPANY**  
JONESBORO :: :: :: INDIANA



## You Can Show Them With a Grabowsky

Dealers who handle the Grabowsky line of commercial power wagons don't have to indulge in vague, general claims of superiority. The Grabowsky has mechanical features, the mechanical correctness of which is apparent at first glance, that can be seen in no other make of power wagon.

There is no more simple, powerful motor seen in commercial vehicles than the Grabowsky motor.

There is no other car with a quick removable power plant, nor any other device that so allows instant inspection and adjustment of the motor quickly and at any time desired.

There is no other car that uses less oil in lubrication than the Grabowsky, or that gives more perfect satisfaction in this respect.

There is no other car that uses hardened Steel bushings in all wearing parts, making the renewal of worn parts unnecessary, and giving the cars indefinite length of life and service.

There is no other car with the simple, sure and effective cooling system found on the Grabowsky.

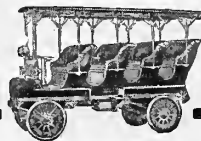
Agents who sell Grabowsky cars don't have to depend on theories to sell the cars. They can talk **FACTS**, and **SHOW** them.

*Write for information and unoccupied territory.*

**Grabowsky Power Wagon Co.**

80 Champlain Street     ::     Detroit, Mich.

Standard Mfrs. A. M. C. A.



## "BABCOCK" MODEL 30



We shall be able to make  
deliveries in April.

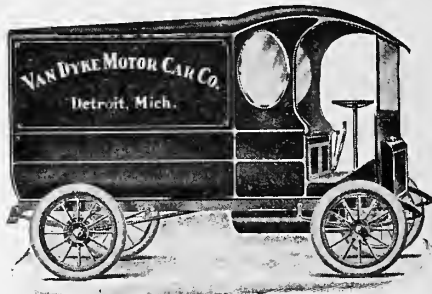
Write for Descriptive Catalogue

**35 HORSE POWER**

Price, \$2250.00

**H. H. BABCOCK CO.**  
**WATERTOWN, N. Y.**

## Van Dyke Delivery Wagon \$750



Viewed from any standpoint—as a prospective purchaser or a dealer in commercial cars—you can't match the "Van Dyke" quality, the "Van Dyke" prices, nor the wonderful "Van Dyke" efficiency, design, simplicity of construction, ease of operation, economy of up-keep or durability. In fact

### Van Dyke Delivery Wagons

are in every feature incomparably superior to any commercial cars yet designed.

Investigate, write us and we will supply you with information which will prove a revelation to you.

**The Van Dyke Motor Car Company**  
**DETROIT, MICH.**

## Sale Extraordinary

### Best Grade

Packards	Buicks
Peerless	Maxwells
Pierce-Arrows	Chalmers
E. M. F.'s	Rainiers

and in fact every make

**PRICES LOWEST**

Also bodies, new or second-hand.

**SEND FOR LIST**

## Broadway Auto Exchange

36-40 West 60th St.

New York City



¶ This halftone is two exposures on the same plate.

¶ The lower shows spring under test.

¶ The upper is the spring released. All springs are tested thus and show the resiliency of our product.

**Tuthill Spring Company**  
754 Polk Street, Chicago

# JERICO AUTO HORN

¶ JERICO takes the exhaust AFTER it leaves the muffler and turns it at will into a mellow town signal or a powerful touring warning. All back-pressure on the motor, all clogging, all racing of the motor is avoided. JERICO sounds clearly at **any** speed with clutch in. Made of Aluminum. Largest size 11 in. x 5 in. Attached to muffler outlet pipe by clamp coupling. Have your dealer ask us for JERICO DATA BOOK telling size for your car or write us for booklet 22.

**\$7, \$8, \$9, \$10**

complete, including pedal, coupling, cable, etc.

**Randall-Faichney Co.**  
251 Causeway St., Boston, Mass.

## New Dover AUTOMATIC Gasoline Funnel

PATENT APPLIED FOR



Automatic

Ball Valve

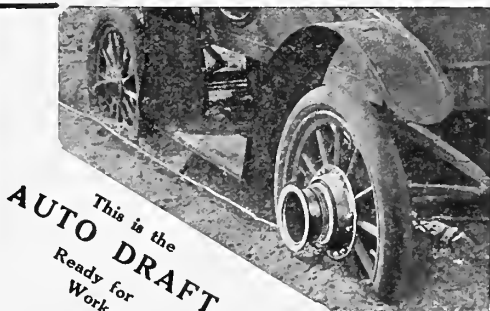
Indestructible

Shut Off

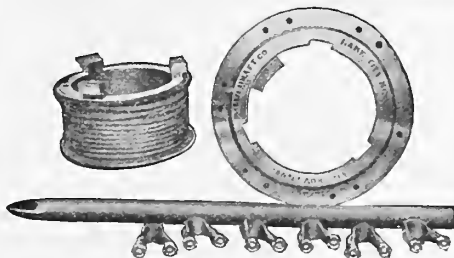
Simply lift the Funnel from the filling hole in the tank or can and **NO MORE** gasoline can run through the spout.

*New 1910 catalog now ready*

**Dover Stamping & Mfg. Co.**  
Cambridge, Mass.



This is the  
**AUTO DRAFT**  
Ready for  
Work



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**DON'T STAY STUCK IN THE  
MUD**

Equip Your Car with a Set of Auto Drafts  
Write Dept. J for Particulars

**Auto Draft Co. :: Lake City, Minn.**



**Cut This Season's Tire Expense—Act Now**

Could we but convince the motorist who doubts the efficiency of Britcson Treads—we couldn't with a dozen factories meet the rush of orders.

Last season our facilities were taxed at times nearly to the breaking point—yet the proportion of tires equipped as compared with those going without such protection represents just a drop in the bucket.

With enlarged manufacturing facilities we hope to keep abreast of the constantly increasing demand for this admitted leader of tire protectors.

When motorists now-a-days gather together—discussing the problem of tire up-keep, favorable mention, and that only, is heard of

**Britcson Treads (Detachable)**

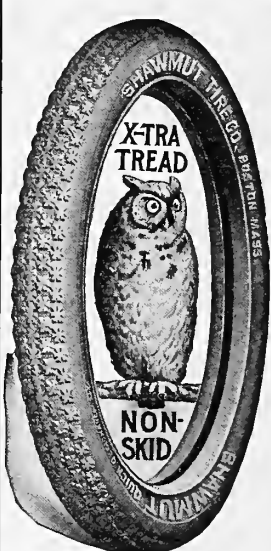
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The Britcson Tread takes all the punishment—stops every opportunity for puncture or blow out or skidding.

**Britcson Mfg. Company**  
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Let us tell you the complete story right now.

It is contained in our late booklet "The Enemy of Tire Expense"—yours for the asking.



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"Proved Best"

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**NOTE** the classy appearance of this jack. It is a high-class machine manufactured on the interchangeable plan, same as a motor.

It is perfectly smooth on the outside. All its working parts are enclosed and packed in grease. It never needs oiling, and does not smear grease over tools or tubes in the car or the operator's hands. No dirt can get to the working parts of this jack.

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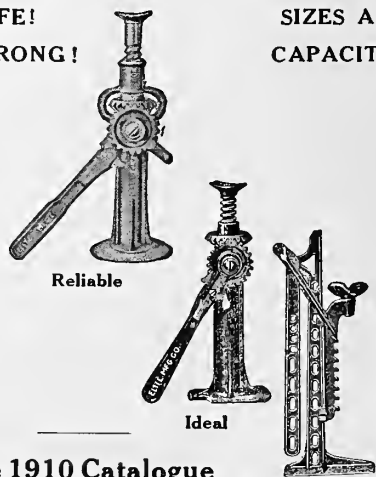
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Put one on your show case and see how quickly it will sell itself.

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**QUICK!**  
**SAFE!**  
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**MADE IN ALL SIZES AND CAPACITIES**



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CARROSSERIE AUTOMOBILE

## ALUMINUM BODIES

TO FIT ALL CHASSIS

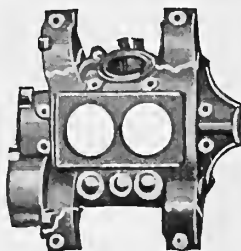
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*Estimates Submitted*

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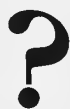
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**For 3 cents Each**

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## List of Retail Dealers, Garages, etc., \$25

Our list of garages, repair shops and dealers in automobiles, motorcycles, etc., is the most complete and accurate in existence. It is classified for handy reference and exactly meets the requirements of those who want to circularize the retail trade.

MOTOR CYCLE, MOTOR BOAT &  
**AUTOMOBILE**  
TRADE DIRECTORY

MARKET @ 49TH STREETS  
PHILADELPHIA, PA.

# Motoring Expense Cut Down

FOR two years we have been gathering sworn mileage and upkeep (repair) statements of Winton Six owners.

Figures covering 20 Winton Six cars, owned and driven in and around New York, Boston, Atlantic City, Philadelphia, Pittsburgh, Buffalo, Cleveland and Chicago, and on many long and hard tours, are given on this page.

¶ These 20 cars totaled 184,190 miles—more than seven times the distance around the earth at the equator. A fairly exhaustive test.

Nine of these cars ran 72,721 miles with absolutely no upkeep expense.

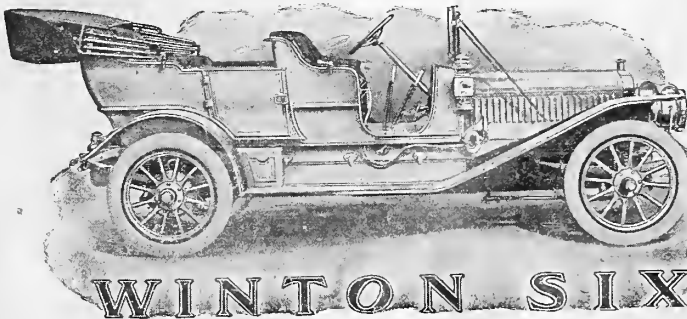
Thirteen of these cars ran 103,226 miles on a total of 73 cents upkeep expense.

Only four of 20 cars had more than \$10 expense each, and these four cars totaled 55,860 miles, averaging 13,965 miles each.

¶ Each of these 20 cars averaged 1315.6 miles per month, 43.8 miles per day. Had to keep moving to do that distance every day, winter, spring and summer.

And the average upkeep expense for each of these 20 cars was 77 cents per 1000 miles.

¶ That's a world's record that goes straight home to the pocket books of these Winton Six owners.



WINTON SIX

Six-cylinder, 48 H. P. motor. Multiple-disk clutch. Four-speed transmission. Instantaneously sensitive carburetor. Bosch magneto, and storage battery. 124-inch wheel base. Frame narrowed in front to permit short turns. Easy riding, semi-elliptical springs all around. Four shock absorbers. And a motor that CRANKS ITSELF. Price, \$3000.

## Sworn Records of Automobile Upkeep

Car Owner and Address	Year	Mileage	Expense
Axelrod, Jacob, New York	1908	7,570	None
	1909	17,720	\$60.00
Bacharach, Isaac, Atlantic City	1909	11,000	.30
Barnsdall, T. N., Pittsburgh	1909	15,669	31.15
Brennan, Jas. T., Brooklyn	1908	6,806	3.00
Burnham, Wm., Philadelphia	1909	8,702	None
Cleunny, J. E., Chicago	1908	5,155	None
	1909	17,003	None
Cuddy, Loftus, Cleveland	1909	8,728	.30
Fish, Joseph, Chicago	1908	5,535	None
Frost, G. W., Montclair, N. J.	1909	10,595	None
Mallen, H. W., Chicago	1909	7,572	1.50
Martin, W. B., Cleveland	1909	10,726	7.50
McAllister, W. B., Cleveland	1909	10,788	26.55
Pickands, H. S., Cleveland	1908	6,632.8	None
Roelofs, H. H., Philadelphia	1908	5,415	None
Rooney, E. A., Buffalo	1908	4,594	.10
Schnaier, Milton, New York	1908	11,683	12.00
Somers, Warren, Atlantic City	1908	6,183	.03
Speare, Mrs. L. R., Boston	1908	6,113.6	None
<b>TOTALS</b>		<b>184,190.4</b>	<b>\$142.43</b>

§ Same car both years. † Carried limousine body part of the time.  
Average Upkeep Expense for 20 Cars—77 Cents per 1000 Miles.

Motoring wasn't expensive to these men.

Because the Winton Six is the car that keeps out of repair shops.

¶ You can compare the Winton Six with any other high-grade car on the market and know for yourself that it has neither a superior nor an equal.

We do not say this boastfully, but to give you a definite statement on which we must make good.

The maker who claims nothing has to prove nothing. We make our claims strong, because we have the car that supports these claims.

¶ And this Winton Six (a 48 H.P.

six-cylinder car that acknowledges no equal) sells at \$3000.

Same horse-power in other accredited makes would cost you from \$4000 to \$4500.

—Therefore, the Winton Six saves its buyer \$1000 to \$1500 on initial cost, an amount that will buy tires, oil and gasoline for two years or more, and pay for many miles of enjoyable touring.

¶ If motoring is expensive, it isn't the fault of the \$3000 Winton Six, with its world's record upkeep ability of 77 cents per 1000 miles.

¶ Let us send our explicit literature—it is too clear to be misunderstood. Clip the coupon and mail it today.

**The Winton Motor Carriage Co.**  
Licensed Under Selden Patent  
Cleveland, U. S. A.

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CLEVELAND . . . Huron Road at Euclid Ave.  
DETROIT . . . 738-740 Woodward Ave.  
MINNEAPOLIS . . . 16-22 Eighth St. N.  
SAN FRANCISCO . . . 300 Van Ness Ave.  
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**THE WINTON MOTOR CARRIAGE CO.**  
417 Berea Road, Cleveland, Ohio.

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